THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
March 20, 1989 · Vol. XXIII · No. 12 · 132 Pages · $2/Copy · $48/Year

COMPUTERWORLD

INSIDE

Executive Report — A few extraordinary staffers can work magic for information systems. Page 69.

In Depth — Is Unix security a contradiction in terms? Page 85.

Profile: Retired general whips Pac Bell's infrastructure into shape for 21st century. Page 61.

IBM hiked prices 5% Friday for all but a few products and services. The company also forecast lower-than-expected profits due to technology problems that stalled mainframe deliveries. Page 120.

High U.S. stakes prompt Japanese giants to pump up MIS marketing efforts. Page 95.

Lotus 1-2-3½ premiere anticipated this week as upgrade for power-less users. Page 4.

DEC jockeying to put documentation on CD-ROM disks. Page 8.

Hacker update: Two canned, one in the can and a fourth still on the shelf. Stories page 16.

PC payback is 10-to-1 if end-user computing is linked to corporate strategy, according to investment study. Page 37.

Users cool to PC server claims

Vendors push faster machines, but LAN buyers tire of power game

BY WILLIAM BRANDEL and PATRICIA KEEFE
CW STAFF

Vendors are lining up for a springtime chest-beating rally to position faster and more expensive PCs as local-area network servers. But their marketing claims may fall on deaf ears, with some users holding off on making purchases until the industry takes a systems approach to LANs.

Compaq Computer Corp., IBM and other personal computer vendors are expected to announce high-end systems based on the as-yet unannounced 33-MHz Intel Corp. 80386 microprocessor, according to industry sources.

But with vendors expected to make claims of up to 33% improvement in performance, industry experts said that the processor will have little to do with LAN server performance. In fact, many corporate users said that little can be done to significantly improve the performance of 386-based LAN servers until Novell, Inc.'s Netware 386 operating system ships later this year.

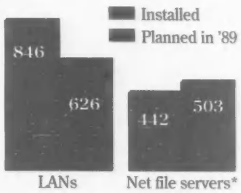
"A PC LAN server just isn't fast enough," said Ronald Blystone, director of management information services at Harsco Corp. in Camp Hill, Pa. Blystone has implemented an Apple Computer, Inc. Macintosh-based LAN. But Harsco intends to expand its use of LANs, and it will opt for a minicomputer-based LAN the next time around, Blystone said, leaving the Macintosh LAN for desktop publishing purposes.

"If there is any degradation on our LAN, it is directly attributable to the [PC] LAN server," Blystone said. "There's too much overhead, too many man-

Continued on page 121

Not a local phenomenon

A survey of 323 companies with more than 2,000 employees indicates a large demand for network file servers



* Defined as whatever machine the respondent uses, generally a 386-based PC but may also be a minicomputer

SOURCE: THE SIERRA GROUP, INC.
CW CHART: JOHN YORK

Businesses glum on FCC ruling

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The Federal Communications Commission adopted its complex price caps scheme for AT&T last week — a major overhaul of the way AT&T's long-distance services are regulated — but business users are not happy with the outcome.

The FCC gave AT&T so much pricing flexibility for its business services that AT&T private line rates could increase as much as 24% in the next four years, according to Brian R. Moir, counsel to the International Communications Association.

Raymond A. Beavan, manager of network services at LTV Steel Co. in Cleveland, said that is a valid concern. If AT&T's private line rates do go up, users may want to switch to other private line suppliers or consider fractionalized T1 circuits, he said.

The new regulatory regime, which will take effect July 1, splits AT&T's long-distance services into three baskets: one for services used primarily by resi-

Continued on page 120

OSF wins Unix interface vote as opposition breaks ranks

BY AMY CORTESE
CW STAFF

If AT&T and its Unix International, Inc. supporters are in the same boat, then it looks like mutiny. In a standards group vote earlier this month, some of AT&T's allies voted in favor of the rival Open Software Foundation's graphical user interface for Unix, according to knowledgeable sources.

At an X/Open Consortium Ltd. board meeting, a proposal to adopt OSF/Motif as a standard interface was approved by a majority of the board members in a preliminary nonbinding vote, according to sources at member companies. The eroding support for AT&T's own interface, Open Look, indicates that the OSF may be succeeding in its bid to wrest away leadership of Unix standards.

The proposal to adopt OSF/Motif was submitted by ICL, a European computer manufacturer and member of Unix International, the sources disclosed.

"We have discussed the user interface in every meeting for the last six months, and we're making good progress," said Bill Bonin, director of North American operations at X/Open. But he declined to comment on the reported vote, saying the board meetings are confidential.

Several Unix International members, including Unisys Corp., NCR Corp. and Ing. C.

Continued on page 8

Sara Lee's recipe omits data center

BY CLINTON WILDER
CW STAFF

CHICAGO — You won't find anything larger than a minicomputer here at the headquarters of one of the world's largest food companies. At Sara Lee Corp., the corporate data center does not exist.

"It's no longer a requirement," said Vincent H. Swoyer, vice-president of corporate systems at the $11.2 billion firm. Swoyer said the information systems executive function "is like driving a car. The computing activity, like the car engine, is running somewhere else, not where you're sitting."

The dissolution of Sara Lee's corporate data center is the result of more than the technological price/performance improvements that allow desktop or departmental systems to perform mainframe-class processing. As the IS function is transformed from back-office support to a critical component of front-line business strategy, many large companies are pushing IS operations — mainframes as well desktop systems — closer to the competitive battle lines of business units. In those firms, this is changing the function of the top IS executive.

TREND SETTERS

"Having corporate IS management physically removed from the data center is an increasing trend," said Bruce Rogow, executive vice-president of Gartner Group, Inc., a research and consulting firm in Stamford, Conn. "The power base has moved to influencing standards and intellectual leadership as opposed to 'I have the computer.' The amount of functionality that was formerly done at corporate headquarters is dissolving."

The role of Swoyer and his corporate IS staff of 23 people is to provide a focal point for hardware standardization, volume purchase discounts and other areas in which the company can benefit from its vast economies of scale across divisions selling everything from pound cake to Hanes hosiery to Kiwi shoe polish.

Swoyer said his role in establishing IS standards for Sara Lee's 50 business units must be consultative, not dictatorial. "You can't do it by fiat," he said. "I don't like to just blindly follow rules. If you took what you

Continued on page 12

NEWSPAPER
#63D################ 5-DIGIT 48106
#UIV7ZE300M0390684# 0010111389
UNIVERSITY MICROFILMS INT 383
UNIVERSITY MICROFILMS INT
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48106
SECOND CLASS

IN THIS ISSUE

NEWS

4 Rumors subside as Lotus gets ready to describe 1-2-3 Release 2.2.

4 Another one — this time Plexus — bites the bankruptcy dust.

6 AT&T assaults Northern Telecom with customer-premise equipment offering.

7 Users annoyed at void left by Compaq-Businessland rupture.

8 DEC spins out CD-ROM disks, replacing printed documentation.

10 Fast-packet technology is about to burst onto the communications scene.

10 AT&T showcases ISDN applications.

12 TRW wins federal approval in acquisition of credit firm.

16 Cornell delays release of virus report pending criminal charges.

16 Computer tampering takes toll on TV execs, others.

120 Procedure takes the heat in Hinsdale fire.

121 PCs finding their way home from the office.

121 HP dual-bus PC hits drag strip.

Quotable

"I wish we could do it over again."

MARTIN CLAGUE
IBM

Referring to the launch of the 9370. See story page 25.

SYSTEMS & SOFTWARE

25 Firms keep free-form DBMS data in line with text management systems.

29 Steinway adds a few scientific arpeggios to the art of piano making.

PCs & WORKSTATIONS

37 Research finds PCs climbing the corporate ladder of assets and recognition.

39 Microrim's DBMS raises some eyebrows.

NETWORKING

51 Bellcore prototype sparks user interest but stubs toes on implementation.

51 Three 'bears' help link trading firm Bear Stearns.

MANAGER'S JOURNAL

61 IS execs' attention turns to business issues, survey says.

COMPUTER INDUSTRY

95 Three Far East giants say: Buy, buy MIS American pie.

95 CEO/founder of Ask resigns with plans to tell her tale.

EXECUTIVE REPORT

69 Renewing human resources in information systems.

IN DEPTH

85 Tips for making your Unix-based system more secure. By Sanford Sherizen and Fred Engel.

DEPARTMENTS

8 News Shorts
20 Editorial
101 Computer Careers
111 Marketplace
117 Training
119 Stocks
122 Trends

IS may need developers who can produce systems like rabbits out of a hat. Page 69.

UPDATE

FROM International Data Corp.'s 24th annual industry briefing last week: "IBM will ship 70,000 AS/400s in 1989; worldwide software revenue will double in three years; major hardware companies are pouring 10% to 15% of *annual revenue* into research and development; 3Com Corp. has been shipping 50,000 network interface cards per month, while the number of PC LAN installations tripled in three years; and multibillion-dollar computer firms are growing in number, not consolidating." This is an industry that's maturing?

Steinway's modern manufacturing maestro. Page 29.

ANDY FREEBERG

EXECUTIVE BRIEFING

■ **An information systems department without a data center?** That's how it is at some companies that are decentralizing and recasting their IS departments as corporate standard setters while moving the hardware to the front line, page 1. TRW eliminates the position of vice-president of IS as part of a broader decentralization strategy, page 12.

■ **The IS organization of the future** will demand three new breeds of employees: those who bond quickly to the business need; those who are passionate about systems development; and those who see the potential of emerging technologies. But finding and keeping these rare people is getting harder. Page 69.

■ **If the security of your Unix system** is keeping you awake at night, there's good reason. The operating system has many security flaws. Fortunately, there are steps IS can take to improve Unix security, and standards efforts will plug many of the leaks. Advice begins on page 85.

■ **Ouch!** That's how some users reacted to a price caps scheme for AT&T adopted by the FCC last week. Users fear the overhaul will leave the door open for AT&T to jack up private line rates in order to make switched services more attractive. Page 1.

■ **Business issues outpace technology** concerns in the minds of IS executives, according to a survey of the Fortune 500. Most cite strategic business reasons as sufficient justification for new IS projects. Page 61.

■ **Be wary of claims** that the coming breed of 80386 PCs make superior file servers. The slew of 33-MHz models to be introduced next month probably won't boost LAN performance significantly, and users say they want systems, not just new hardware. Page 1.

■ **IBM 9370 expectations were overblown,** and a company official admits it. Faced with sluggish sales and eclipsed by the AS/400, the 9370 is being repositioned in niche applications. Page 25.

■ **Users in the news:** Classic piano maker Steinway uses computer-integrated manufacturing to fine-tune production. It has even computer-analyzed Vladimir Horowitz's concert grand to improve consistency, page 29. A provider of financial information finds a way to package mainframe-based data with a PC look and feel, page 37. Wall Street's Bear Stearns uses interconnected local-, metropolitan- and wide-area networks to link everyone to everybody, page 51.

■ **A 1,000% return on investment** is possible if your PC plan is linked to specific strategic goals, a Peat Marwick survey says. The firm advises against using PCs simply to automate manual functions, page 37. Some firms reap big benefits by helping employees buy PCs for their homes, page 121.

■ **1-2-3 Release 2.2** is set to be announced this week for low-end PCs. Sources say it is faster and has useful Undo and macro recording features not found on the current version. Page 4.

■ **Is there a Japanese computer company** in your future? Fujitsu, NEC and Hitachi are boosting their efforts to sell to MIS and acting confident about their chances of picking up market share. Page 95.

■ **End-user training** programs need to address issues such as hidden costs, the danger of computing errors, standards and the impact of computers on how work is done. You can't just teach Lotus anymore. Page 117.

■ **Army training steeled Jack Hancock** for a new career as head of Pacific Bell's $500 million IS department. His new challenge: to build a communications architecture for the next 20 years. Page 61.

■ **Hacker pleads guilty** and may spend a year in jail for penetrating DEC systems and having unauthorized phone access codes. Page 16.

Systems software for MVS data centers:

Enter the world of total solution, total support.

Computer Associates announces an integrated, total software solution for MVS data center automation: **CA-UNICENTER™ II MVS**. It consists of the following **CA-UNIPACK™** modules:

SECURITY, CONTROL AND AUDITING (SCA)
Access control, network security, system audit.

DATA CENTER ADMINISTRATION (DCA)
Problem control, change management, inventory and financial control.

AUTOMATED PRODUCTION CONTROL (APC)
Automating job scheduling, console operations, print management, report distribution.

STORAGE AND RESOURCE MANAGEMENT (SRM)
Tape and DASD management, sorting, disaster recovery.

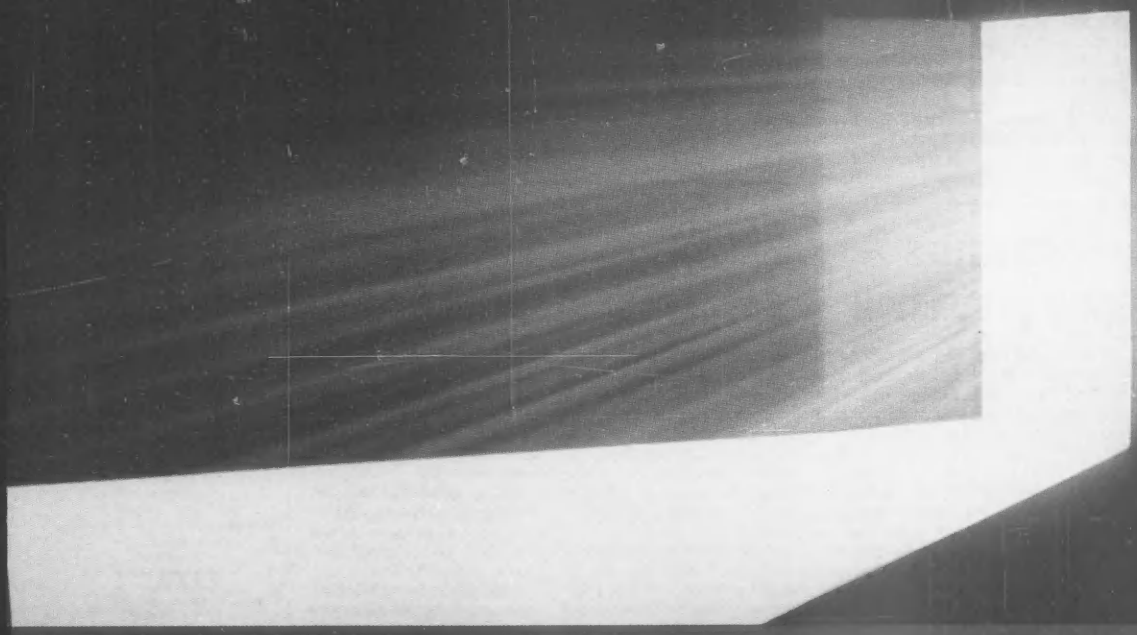
PERFORMANCE MEASUREMENT AND ACCOUNTING (PMA)
Capacity planning, network management, performance measurement, resource accounting, system analysis.

CA-UNIPACKS are groups of advanced products working together to automate major functional areas of the data center. You maximize productivity when you install all CA-UNIPACKS to create CA-UNICENTER® MVS.

Only Computer Associates has the products and expertise to provide MVS data centers with such a cost effective, total solution.

And only Computer Associates offers **CA-UNISERVICE™ II**, a secure link between your mainframe and CA's Customer Service System 24 hours a day. You get online access to software fixes, interactive problem resolution, plus product tutorials and more!

Enter the world of total solution, total support.
Call Dana Williams today:
800-645-3003 (Ext. 0014)



COMPUTER ASSOCIATES
Software superior by design.

- World's leading independent software company.
- Broad range of integrated business and data processing software for mainframe, mid-range and micro computers.
- Worldwide service and support network of more than 100 offices.

Resource & Operations Management • Financial • Banking • Graphics • Spreadsheets • Project Management

Lotus to unveil Release 2.2

BY DOUGLAS BARNEY
CW STAFF

PALM SPRINGS, Calif. — Rumor will turn to fact tomorrow when Lotus Development Corp. Senior Vice-President Frank King officially announces 1-2-3 Release 2.2 and unveils previously unconfirmed details of Release 3.0.

King will put to rest the rumors and end market confusion by laying out the Lotus view of personal computer hardware segmentation. Release 2.2 is an upgrade of the existing product for the low-end Intel Corp. 8088-style user. Meanwhile, 1-2-3 Release 3.0 will set its sights on Intel 80286 or better machines with at least 1M byte of random-access memory, sources said. Lotus declined to comment.

The disclosures, scheduled for the PC Forum show in Palm Springs, Calif., will provide the broad spectrum of Lotus customers with the information they need to finalize product planning. Until now, users have gained insight into the Lotus strategy only through confidential briefings generally available to just the largest of shops.

While the interface remains virtually the same, Lotus' spreadsheet plans have changed dramatically since the announcement of Release 3.0 almost two years ago. At that time, Release 3.0, which is being written from the ground up in C, was to have been a product for all classes of PCs. The firm stuck to its guns until last year, when it became clear that the bulky Release 3.0 just could not be squeezed effectively into the 640K-byte confines of MS-DOS.

Lotus will offer two ways around the memory problem. One is the still-obscure world of DOS Extenders, which trick MS-DOS into working with up to 16M bytes of RAM. This, along with an IBM Personal Computer AT or better machine, will be a requirement to run Release 3.0.

A more fundamental solution is Release 2.2, a product conceived after the firm started work on Release 3.0. Though its history is still vague, sources indicate that last year, a group of developers within Lotus and a third-party organization proposed enhancing the existing assembler-based Release 2.01. At first, Lotus officials turned down the offers, but they relented when developers were not able to trim the girth of Release 3.0.

The project has moved quickly, in part because of the inclusion of technologies Lotus already had such as the cell linking and Undo capabilities of Lotus' Human Access Language, better known as HAL.

Next in a long line

Release 2.2 is expected to draw from the heritage of today's version, which is still faster and provides more worksheet space than other packages, according to software raters.

Release 2.2 may slow the momentum of Release 3.0, one user familiar with the product said. It is even faster than the already speedy Release 2.01 and works with existing Lotus add-ins. The system supports the old Lotus file format and uses a special programming trick to free up an additional 30K bytes or so of RAM, a source briefed by Lotus said.

Two utilities — the Speed Up intelligent recalculation utility, and Learn, a macro recorder — are now built into the product. Release 2.2 will also boast better graphics and offer a taste of so-called spreadsheet publishing. Although a delivery date is unclear, many expect Release 2.2 to ship this summer at $495.

In a previous interview, King defined three distinct PC configurations. At the lowest level is the traditional PC with 640K bytes of RAM, which is expected to be served by 1-2-3 Release 2.2. Systems with 1M to 2M bytes will be served by Release 3.0 under either MS-DOS or OS/2. Systems with 4M bytes or more will be served by the OS/2 Presentation Manager.

Cray scraps X-MP line, pushes Y-MP option

BY JEAN S. BOZMAN
CW STAFF

MINNEAPOLIS — Cray Research, Inc. said last week that it is phasing out its 7-year-old X-MP supercomputer line by year's end and moving the X-MP customer base over to Y-MP technology. At the same time, Cray announced 19 additional models in the Y-MP series, ranging in price from $5 million to $23.7 million.

The move comes in anticipation of more sales in the commercial sector and more X-MP customers switching over to the Y-MP's 32-bit addressing scheme.

It also comes about one year before the anticipated announcement of the Cray-3 high-end supercomputer. Cray-3s are expected to arrive at customer sites by late 1990, Cray spokesmen said.

With upward compatibility in place, the X-MP's days are indeed numbered. "We'll be phasing over to the Y-MP by the end of the year," Cray spokesman John Swenson said last week. "But we wanted to make sure that our X-MP customers felt they weren't buying into a dead-end product."

The first eight-processor Cray Y-MP/832, which was shipped to the National Aeronautics and Space Administration's Ames Research Center in Moffett Field, Calif., has been running at Ames since August.

John T. Barton, high-speed processor manager at NASA/Ames' Numerical Aerodynamic Simulation Division, said the new Y-MP was debugged and running smoothly within 30 days and was in full production by February. The Y-MP, with 32M words of memory, has 1,000 regular users. However, users continue to submit longer jobs to the Cray-2, which has 256M words of memory, he added.

"The new machines have some anomalies when they first come in, but we enjoy solving the problems that make them stable for production," Barton said.

Both the X-MP and the Y-MP can run the same programs under Unicos, Cray's Unix operating system, although a standard conversion for Fortran applications is possible.

A Cray spokesman said that the company is encouraging Unicos use for all its machines and that Unicos will be the only operating system on the Cray-3.

Cray began offering X-MP users upward compatibility with the Y-MP last May, three months after the first Y-MP processor was announced. Compatibility came in the form of X-MP Extended Architecture, which allowed X-MP 24-bit programs to run in a 32-bit mode. (Despite the addressing change, all Cray machines still use 64-bit word size.)

Customers may continue to order the X-MP for the rest of the year, Swenson said.

An eye on business

Cray's expanded Y-MP line is intended to replace the X-MP series and is part of a strategy to attract more commercial customers

	Number of configurations	*Number of CPUs*	*Main memory (in millions of words)*	*Price*
Y-MP2	4	1 or 2	16 or 32	$5M-$7.6M
Y-MP4	9	1, 2 or 4	16, 32 or 64	$6.5M-$13.5M
Y-MP8	6	4 or 8	32, 64 or 128	$13.4M-$23.7M

SOURCE: CRAY RESEARCH, INC.
CW CHART: FRANK C. O'CONNELL

Plexus Computers files for bankruptcy protection

BY J. A. SAVAGE
CW STAFF

SAN JOSE, Calif. — After firing three-quarters of its employees earlier this month, Plexus Computers, Inc. filed for Chapter 11 bankruptcy protection last week.

"I immediately went out and hired two of their guys who had been laid off," said Chet Punicki, director of data processing at the Colorado Department of State, which has had a Plexus imaging system for almost a year.

"While they still have an 800 number for system software, you have to get out there for application software and hardware support," he said. "If I have to, I'll carry on myself."

Punicki, who has been transferring old documents off microfilm to the Plexus optical storage system, said that Plexus was due to have shipped him optical character recognition software only a day before the company's massive layoffs. Although he has yet to receive it, Punicki said that Plexus did promise to send it.

Another customer, Prudential Insurance Co. of America, agreed to a $10 million multisite system last October to manage the work flow of its life insurance underwriting process. A spokesman refused to say how the company plans to cope with the bankruptcy reorganization. Ironically, Prudential, as an institutional investor, is also reportedly listed as a creditor in the Chapter 11 petition.

The company had revenue of about $27 million on its imaging systems in 1988, not enough to make it profitable. It has been funded by a group of venture capitalists since 1980; early this month, the group pulled out, leaving the company to operate on its accounts receivable.

COMPUTERWORLD

Editor in Chief
Bill Laberis
Executive Editor
Paul Gillin

News Editor
Peter Bartolik
Assistant News Editor
James Connolly
Senior Editors
Clinton Wilder, Management
Elisabeth Horwitt, Networking
Patricia Keefe, Networking
Douglas Barney, PCs & Workstations
Stanley Gibson, Software
Michael Alexander, PCs & Workstations
Rosemary Hamilton, Systems
Nell Margolis, Industry
Senior Writers
Alan J. Ryan
Amy Cortese
William Brandel
Staff Writer
James Daly
New Products Writer
Sally Cusack

Features Editor
George Harrar
Senior Editors
Glenn Rifkin
Joanne Kelleher, Spotlight and Executive Report
Michael L. Sullivan-Trainor, Special Projects
Senior Writer
David A. Ludlum
Associate Editors
Deborah Fickling
Kelly Shea, In Depth
Assistant Editor
Sharon Baker
Researchers
Bonnie MacKeil
Kevin Burden

Chief Copy Editor
Mary Grover
Assistant Chief Copy Editor
Donald St. John
Features Copy Editors
Julie L. Cook
Joseph J. Fatton
Copy Editors
Cathleen A. Duffy
Richard R. Pastore
Joyce Chutchian
Carol Hildebrand

Art Director
Nancy Rawal
Graphics Specialists
Frank C. O'Connell
John B. York
Graphics Researcher
Laura O'Connell

Assistant to the Editor in Chief
Linda Gorgone
Editorial Assistants
Patricia Faherty
Lorraine Witzell
Megan Santosus
Rights and Permissions Manager
Sharon Bryant

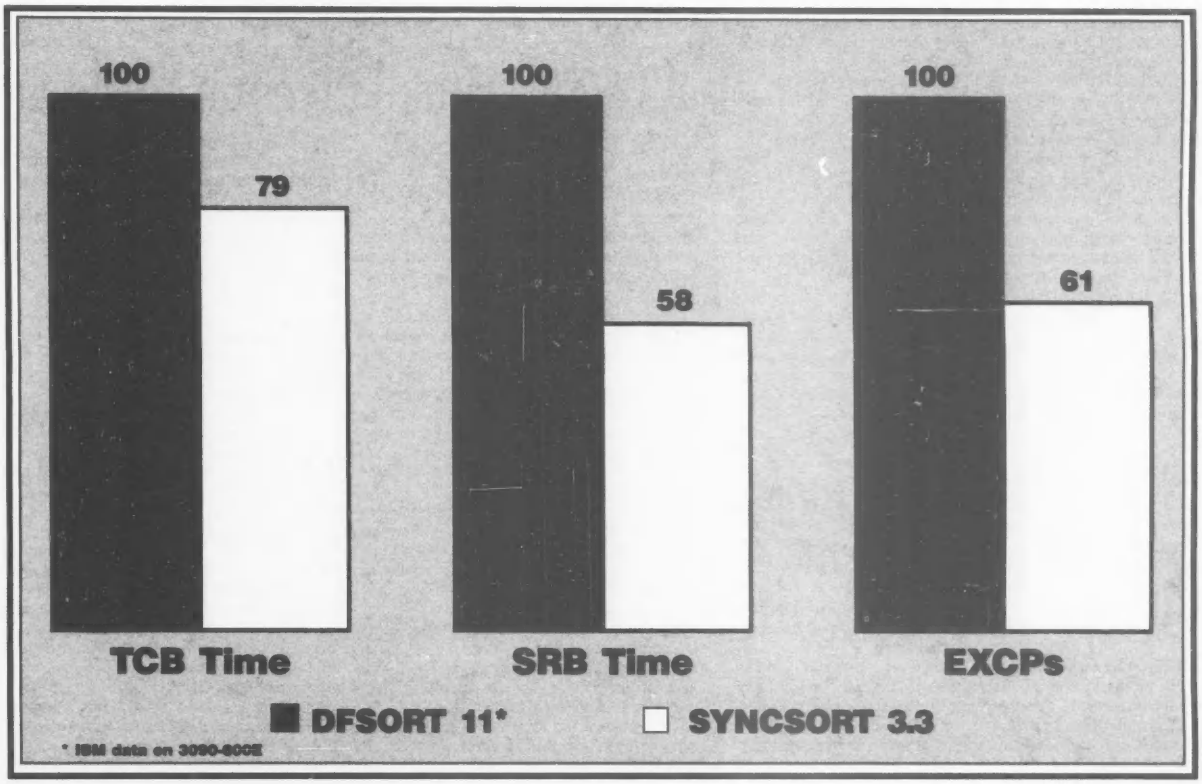
News Bureaus
Mid-Atlantic
201/967-1350
Robert Moran, Correspondent
Washington, D.C.
202/347-6718
Mitch Betts, Bureau Chief
West Coast
415/347-0555
Jean Bozman, Bureau Chief
Julie Pitta, Senior Correspondent
J.A. Savage, Correspondent
Patrick Waurzyniak, Correspondent
Mary Elliston, Editorial Assistant
Midwest
312/827-4433
Ellis Booker, Correspondent

Computerworld Focus on Integration
Editor
Ann Dooley
Managing Editor
Lory Zottola
Senior Editor
Stan Kolodziej
Senior Writer
Helen Pike
Art Director
Tom Monahan
Intern
Mark Breibart

IDG News Service
Kathleen A. Gow, Director

Main Editorial Office
Box 9171, 375 Cochituate Road
Framingham, MA 01701-9171
508/879-0700
Subscriptions: 800/669-1002

DATASPACING
&
HIPERSORTING
with
SyncSort in ESA



ESA Exploitation à la SyncSort

If you want to maximize your ESA investment, then find out why SyncSort is the better choice.

Call us at **(201) 930-8200** to arrange for a comprehensive benchmark on your system.

syncsort INC.

Where Performance Is the Issue.

© 1989 Syncsort Incorporated, 50 Tice Boulevard, Woodcliff Lake, NJ 07675

Air Force 3B2 minis don civilian garb

BY ROSEMARY HAMILTON
CW STAFF

AT&T last week rolled out new 3B2 minicomputers and said it hopes its big U.S. Air Force contract win late last year will help the 3B2s become a favorite of corporate midrange users.

Coinciding with this introduction, AT&T lowered midrange and former high-end 3B2 system prices by 12% to 30%.

The 3B2/1000, which tops out at 16 million instructions per second, is based on a multiprocessor architecture and uses the latest microprocessors developed by AT&T. It will serve as the new high end of AT&T's 5-year-old minicomputer line.

With the Air Force contract still a fresh memory, the company is hoping commercial users will view the Air Force selection of some 20,000 systems as a compelling endorsement of the company's product, according to James Clark, product management vice-president of minicomputers and high-performance systems.

However, some current 3B2 users contacted last week said they weren't interested in purchasing another AT&T minicomputer. Cedar Fare in Sandusky, Ohio, an amusement park and hotel management firm, uses a 3B2/600 as an application-specific system in an area of limited growth, said Don Race, director of information systems. "We're really an IBM shop, and we don't plan on pursuing Unix," he said.

Plans to sell minis

Chris Porch, vice-president of computer operations at Pacific Century Advisors, Inc., a financial services firm, said his company plans to sell its 3B2 minicomputers in favor of a new local-area network strategy.

The 3B2/1000s are the commercial version of the system that the Air Force selected. The winning system was a modified 3B2/600 that included multiprocessors and a version of Unix geared toward high-volume transaction processing with support for multiple processors and higher data availability.

The 3B2/1000s use a master/slave processing concept, although system calls that do not involve I/O devices can be made from any processor in the complex, according to Steven Lester, a divisional manager of 3B2 product management.

The 3B2/1000 series consists of two systems, the Models 60 and 80, that use the same AT&T 32200 microprocessor. The higher end Model 80, however, runs it at a faster speed. AT&T positions the 3B2/1000s as a three-model series. It includes a Model 70, which is a Model 60 with additional processors, main memory and disk storage.

The Model 60 is a uniprocessor version, while the Model 70 can have up to four processors. The Model 80 can be configured with one to four processors.

Users of AT&T's 3B2/500s, 600s and 700s can field-upgrade to the new systems, the company said.

Bell ringer

AT&T's 3B2/1000 series uses Unix System V, Release 3.2.2, and each model can be configured with additional processors

	CPU	Main memory	Mass storage	Typical user load	Base model performance	Base price
Model 60	WE32200, 22 MHz	4M bytes	300M bytes	64	5 MIPS	$39,900
Model 70	WE32200, 22 MHz	16M bytes	600M bytes	80	7 MIPS	$59,900
Model 80	WE32200, 24 MHz	16M bytes	600M bytes	100+	9 MIPS	$74,900

SOURCE: AT&T
CW CHART: JOHN YORK

AT&T's Datakit takes on Meridian

BY ELISABETH HORWITT
CW STAFF

BASKING RIDGE, N.J. — AT&T assaulted Northern Telecom, Inc. in the local-to-wide-area network interconnectivity arena last week with the release of its Datakit II Virtual Circuit Switch as a customer premises equipment product.

AT&T had previously sold Datakit only to regional operating companies that wanted to set up central office-based interconnectivity services. Now the system brings to the user premises almost exactly the same capabilities as Northern Telecom's Meridian Data Networking System for handling "the intra- or inter-corporation communications flow — a hot area," said Peter Bernstein, senior analyst at Probe Research, Inc. in Morristown, N.J.

A comparison of the two vendors' platforms ends up in a dead heat, Bernstein said. Both establish virtual connections between networks, hosts and user workstations, either locally or over distance. Both vendors' offerings can support a much higher total throughput than either a private branch exchange (PBX) or most LAN bridges, Bernstein said. Datakit II is said to have a total throughput of 8M bit/sec. per node, with modular upgrades possible. It can interconnect up to nine LAN segments, AT&T said.

Both Datakit and Meridian DNS are said to support a wide range of identical protocols, although DNS supports the CCITT 802.5 Token-Ring and Datakit thus far does not. Both are said to offer strong support of IBM's Systems Network Architecture and can be channel-attached to an IBM host.

"Datakit can take the place of an IBM front-end processor, providing connectivity for both synchronous and asynchronous devices," claimed AT&T staff manager Todd Giacobbe. "It targets users with multiple hosts and LANs at different locations; we definitely see it as competing with Meridian DNS."

One advantage of Datakit is that a number of local carriers already use the system to provide users with data communications services, Bernstein said. Datakits on user premises will be able to access those services — including a 45M bit/sec. metropolitan-area networking capability that AT&T is planning to add to the carrier version of Datakit, he said.

Datakit II can send alerts and alarms to AT&T's Unified Network Management Architecture by using AT&T's Starkeeper Network Management System as an intermediary, the vendor announced.

AT&T presented the user version of Datakit as a keystone of its new Custom Network Offering II, a service for integrating multivendor networks that use a variety of protocols and applications.

AT&T phasing out ISN

AT&T also made it clear that it is phasing out Information Systems Network (ISN), an asynchronous switching device that shares many of Datakit's interconnectivity features. The vendor announced that it would protect ISN users' investments by allowing them to link to Datakit's wide-area network and by providing a migration path from ISN to Datakit.

The user version of Datakit II is scheduled for release in June and is base-priced at $70,000, an AT&T spokesman said.

AT&T also announced that its Premises Distribution System (PDS), a set of building-wiring specifications for both voice and data connections, now supports the Fiber Distributed Data Interface (FDDI) for high-speed fiber-optic cable connections. Cabling that conforms to the older fiber-optic PDS specification can also support FDDI devices, an AT&T spokesman said. The vendor plans to release FDDI products at an undisclosed date, according to the spokesman.

DEC launches PBX tools based on CIT blueprint

BY PATRICIA KEEFE
CW STAFF

BOSTON — Seventeen months after it first announced its Computer-Integrated Telephony (CIT) Program, Digital Equipment Corp. last week unwrapped the first North American offerings based on its layered blueprint for integrating voice and data applications.

Featured were the first off-the-shelf packages targeting host-to-private branch exchange (PBX) links, taking users a step beyond mere physical integration or the ability to just pass voice/data signals over the same wire.

"Neither AT&T nor Rolm has an off-the-shelf product with a flexible applications interface that can support a wide variety of applications," said Robert Cameron, associate director of Dataquest, Inc.'s East Coast branch.

CIT — which some analysts say is simply DEC's phrase for Integrated Services Digital Network (ISDN) — is intended to provide programs capable of tying computer software into the switching capability of the telephone system.

However, analysts contend these applications, which are heavily focused on customer service and telemarketing, are targeted at very narrow markets.

John Scoggin, supervisor of network operations for Delmarva Power in Newark, Del., agreed. A big user of Northern Telecom, Inc.'s SL/1 switches, Delmarva uses DEC machines for specific real-time applications such as computer-aided design. Most of its customer service applications are IBM CICS-based. "As a result, integrating Northern Telecom in with the IBM environment would be a lot more useful to us," he said.

For the U.S. and Canadian markets, DEC introduced two products based on CIT and Northern Telecom's ISDN Applications Protocol (ISDN/AP) products: the VMS CIT Server and the VMS CIT Applications Interface.

The VMS CIT Server is said to link a DEC VAX to a CIT-compatible PBX — in this case, Northern's Meridian SL/1 — to bring integrated voice/data applications to the desktop.

DEC's CIT Applications Interface reportedly provides programmers with a library of VMS routines with which to initiate calls and monitor the use of telephones linked to a PBX. They can also develop applications that use basic PBX features.

Northern's ISDN/AP is an intelligent software link said to provide message exchange capabilities that both coordinate and integrate office automation and data processing applications with the SL/1 switching services. Pricing ranges from $10,000 for the SL/1SR to $20,000 for the SL/1X.

The VMS CIT Server, priced at $3,000, and the VMS CIT Applications Interface, priced from $450 to $14,250, are slated to ship in April.

In addition, six software developers unveiled applications based on the DEC and Northern Telecom development tools: Information Builders, Inc., Ameritech Information Systems, Inc., NPRI, The Data Group Corp., Turnkey Systems Division of SMS and Volt Delta Resources, Inc.

Token-Ring chip delays stall vendors

BY PATRICIA KEEFE
CW STAFF

Late chip deliveries for the next-generation 16M bit/sec. Token-Ring are mucking up the agendas of third-party suppliers.

Most of these Token-Ring vendors are busy revamping their 16M bit/sec. card strategies and delivery dates, which reportedly will be thrown off by late chip deliveries from Texas Instruments, Inc.

In December, TI announced a reduced chip set that supports 16M bit/sec. transmission, scheduling volume deliveries for June. Many vendors followed up with promises to provide 16M bit/sec. cards in the spring, which looks unlikely now.

Although a TI spokeswoman said the vendor is still targeting midyear volume delivery, customers said they have been given dates ranging from September to late in the fourth quarter.

TI is shipping about 50 "tester" chip sets a month, said Scott Haugdahl, an analyst at Token-Ring watcher Architecture Technology Corp. "It's just a matter of getting the reliability down," he said.

TI "told us the schedule is slipping and that they expect to ship in volume in September," said William Swift, a product line manager at 3Com Corp.

Still others report even later general availability. Based on what TI has told Madge Networks Ltd., Vice-President Julian Brooks said he is expecting year-end bulk delivery. "It looks like we'll have nine months to think about [what we're going to do]," he said.

In the worst case, such a delay would prove a boon to IBM, which would benefit from more than a year's lead time in the 16M bit/sec. market. IBM began shipping its 16M bit/sec. card in December.

Perhaps more of a concern to third-party Token-Ring suppliers is exactly how TI plans to respond to IBM's switchable 4M/16M bit/sec. chip.

IBM has been shipping a dual-mode card. The major difference between its chip set and TI's, according to Swift, is that IBM handles 16M bit/sec. speed with one chip. In TI's case, vendors would have to use two processors to IBM's one. To switch over to 4M bit/sec. speed, both IBM and TI use external circuitry.

TI's dual front-end processor approach is neither as economical nor as clean as IBM's single-processor strategy, Swift said. "IBM definitely has a higher level of integration," Haugdahl agreed.

However, Pulse Engineering, Inc. has introduced a dual 4M/16M bit/sec. front end that may be the answer to TI's problem, Haugdahl said.

Competitors are also uncertain about whether to build 4M, 16M or 4M/16M bit/sec. cards.

The big question appears to be whether most users will pay more for a dual-mode card. IBM has priced its dual-mode adapter just $150 higher than its current 4M bit/sec. offering. Given this pricing strategy, there are those who say the 4M bit/sec. card is dead; for now, no one is willing to bet on it.

Compaq service gap galls users

BY JULIE PITTA
CW STAFF

HOUSTON — Compaq Computer Corp.'s decision to terminate its association with Businessland, Inc. has users still scrambling to find alternative sources for Compaq personal computers.

Last week, Compaq said it has authorized Businessland to provide warranty service until April 21, 1990 — one year from the date Businessland will cease selling Compaq PCs. Typically, Compaq systems come with a one-year warranty honored by the company's dealers.

Despite user irritation over the dispute, they said they will turn to new sources for Compaq computers.

"From my point of view, it's frustrating," said Will Lane, manager of decision support systems at American Edwards Laboratories, a Santa Ana, Calif., division of American Hospital Supply Corp. "I don't understand why a vendor would discontinue a primary distributor. It's as though two silly children were having a disagreement."

Lane said his company will seek a third party for maintenance, although he said he is leery of a third party's ability to provide parts. He will also look to a new dealer to supply Compaq PCs.

"Businessland provides us the best in services," he said. In the last year, American Edwards Labs has streamlined its in-house service group, relying more heavily on outside sources for support.

Anthony Oresteen, a vice-president at Continental Bank in Chicago, said his company has standardized on Compaq. The bank will also find a new source for Compaq systems. "There's always another dealer out there," Oresteen said. Continental Bank has already engaged a third-party service organization for maintenance. "We don't use it for the Compaqs much; they're good-quality systems," he said.

Compaq announced in February that it would terminate Businessland as an authorized dealer after a contract dispute.

VSAM DATA COMPRESSION
Without the CPU Overhead
IAM REDUCES THE SIZE OF YOUR VSAM FILES BY 30 TO 70%

IAM'S FILE STRUCTURE — SAVES 20 TO 40%
IAM uses an advanced file structure which is far superior to VSAM. IAM's supercompressed index, freespace concepts and blocksizes make much more efficient use of disk space.

IAM'S DATA COMPRESSION
SAVES AN ADDITIONAL 20 to 50% DASD SPACE
Most files contain records with unused fields or repeating sets of characters. When IAM applies its proprietary compression techniques, the result is an additional 20 to 50% reduction in file size.

IAM's CPU time is dramatically less than competing compression products. In fact, since IAM's CPU time is normally much less than VSAM, IAM with data compression takes less CPU time than normal VSAM processing.

TRANSPARENT
Online systems (CICS), BATCH jobs, TSO, SMP/E and other applications make extensive use of key indexed VSAM (KSDS) files.
IAM is a transparent alternative to VSAM KSDS files, which substantially reduces the impact of VSAM processing in your installation. There are no modifications to programs or JCL to use IAM files in place of VSAM.

AUTOMATIC RELEASE OF UNUSED SPACE
IAM takes the guessing game out of VSAM space allocation. Large amounts of disk space are wasted when users overestimate how much space VSAM requires or how many records a file will contain. VSAM cannot release overallocated space.

FREE VSAM SPACE SAVINGS ANALYSIS*

SPACE SAVINGS

DATA SET NAME	VSAM TRKS ALLOC	VSAM TRKS USED	IAM TRKS STD	IAM TRKS COMPR	% SAVINGS STD	% SAVINGS COMPR	TOTAL RECORDS	AVERAGE LARGEST	MAX LRECL
BIG.CLUSTER	37155	37155	27855	15600	25	58	4754670	233 502	580
CICS.FILE.MASTER. TABLE.CLUSTER	21000	19005	12720	9495	33	50	5068165	150 150	150
NAME.ADDRESS.FILE	9315	8985	6465	1875	28	79	428529	680 2090	2090

The VSAM simulation report displays the current size and data characteristics of your VSAM files and how much space IAM will save you with and without data compression.
*To see your VSAM usage, send for INNOVATION's free VSAM reporting programs.

Call for a Free No Obligation 90 Day Trial
Supports MVS, MVS/XA and MVS/ESA
Makers of FDR and ABR

INNOVATION DATA PROCESSING
275 Paterson Avenue, Little Falls, NJ 07424 • (201) 890-7300

NEWS SHORTS

IBM as PCM

A bit of role reversal may soon be taking place in Japan. Last week, IBM Japan reportedly outlined plans to gain more mainframe market share in that country — currently dominated by Hitachi Ltd. and Fujitsu Ltd. — by expanding its hardware and software offerings that allow users to run both competitors' software on IBM mainframes. One industry analyst likened the move to a classic plug-compatible manufacturer (PCM) strategy, only this time IBM is the PCM. Users will apparently be required to run IBM's Processor Resource Systems Manager to set up a separate Fujitsu or Hitachi operating environment.

Retail group in antivirus role

At the request of specialty-chain MIS executives, the National Retail Merchants Association in New York has agreed to become a clearinghouse for information about computer viruses in general merchandise retailing. The Retail Virus Control Center is charged with recording reported virus attacks on retail communications networks and with collecting and distributing information about products and methods that can be used to ward off or recover from the effects of a virus.

ETA posts bounty

Get your pencils sharpened and adjust those thinking caps. Control Data Corp. and its supercomputer subsidiary ETA Systems, Inc. have offered $50,000 to anyone demonstrating a massively parallel computer complex — one containing at least 1,000 processors — that can perform a set of real-world benchmarks at supercomputer speeds. The firms said the competition is meant to spur innovation in supercomputer use.

Convergent spin-off

A team of private investors last week acquired litigation-support software maker Document Automation Corp. from Convergent, Inc. in a leveraged buyout. Washington, D.C.-based Document Automation said the new management of the company includes investors Ben Hyatt as chairman and chief executive officer, Stanley Morgenstein as president and Edward H. Carlson, formerly at Oracle Corp.'s federal systems group, as an executive vice-president. The price was not disclosed.

Grid turns to desktop

Grid Systems Corp., long known as a maker of high-end laptop computers, last week introduced its line of desktop personal computers based on Intel Corp.'s 80286 and 80386 processors, including a 20-MHz Intel 386-based model with IBM's Micro Channel. The machines are made by Grid's parent Tandy Corp. and have been modified in appearance and features to set them off from Tandy's desktop line.

Wang lays off service workers

Wang Laboratories, Inc. last week confirmed a nationwide layoff of 180 field service employees and some consolidation of those offices. A spokesman said the cutbacks followed a review of customer service manpower and were initiated because of "increasing efficiencies and general product liabilities." He claimed Wang will be able to provide the same or better quality job of hardware servicing. Wang also closed its Lowell, Mass., regional call-in service center, which affects about 100 people who will be offered transfers to the remaining two centers.

Navy suspends Unisys

The U.S. Navy has barred three Unisys Corp. defense units from receiving new government business until it can thumb through company policies designed to prevent a recurrence of the recent procurement scandal. The move affects units that account for about 75% of Unisys' $2.4 billion annual defense revenue and came despite months-long investigative cooperation by the firm and the dismissal of 15 Unisys executives. Navy and Unisys representatives are also working on a settlement that could cost the company up to $100 million but allow it to avoid indictment.

CDs hold key to DEC software

BY AMY CORTESE
CW STAFF

Digital Equipment Corp. today will be one step closer to its vision of having all its software and documentation on every customer's desk. The company will make available on one compact disk the complete VMS and Decwindows documentation — which in paper form spans 15 feet of shelf space.

The move is the latest in DEC's innovative software distribution strategy, in which it plans to eventually predistribute all software and control access through the use of codes to "unlock" programs that a customer has licensed. New CDs with updated software and documentation would automatically be sent to customers every two months or so.

Last April, DEC announced that VMS was available for the first time on compact disk. Beginning this January, it has offered what it calls "consolidated software distribution," bundling VMS and "layered" software products on one CD. The first consolidated disk included 50 software programs in addition to VMS; with the March release, there are now 70, including compilers, computer-aided software engineering tools and workstation software.

Although DEC acknowledged that only a small part of its customer base has taken advantage of the new program, it expects that all its customers will want to migrate to CD. DEC officials said the firm will continue to offer software on the traditional media as long as demand exists.

While users contacted last week expressed interest in software distributed on compact disks, managing the increasing volumes of documentation was more of a burning issue.

"The documentation is what justifies the expenditure to get a CD reader and attach it to a machine," said Mike Krueger, MIS manager at Allen Bradley Co. in Highland Heights, Ohio. He said he found the idea of replacing the "orange wall" of VAX system software documentation with an on-line version appealing. Noting Allen Bradley's four data centers, each with its own VAX cluster, Krueger said, "It would be nice to let these people have access to up-to-date documentation from a central site."

Distributing software on compact disks will benefit customers as well, according to Paula Zenitz, product manager at DEC's Software Business Technologies Program. In addition to their ease of installation, under DEC's predistribution program, shipping time — which can take up to several weeks — would be eliminated.

Robert Rankin, operations supervisor at Hughes Network Systems, Inc., said that although his shop does not have a CD player yet, it is seriously considering it. "CD is not a thing of the future anymore — people are warming up to it." Rankin said his shop, which is cramped for space, has three offices full of documentation that could be replaced by a few compact disks.

Good or large vendors

Jay Bretzmann, a senior analyst at market research firm International Data Corp., said that distributing software on CDs makes economic sense for large systems vendors. However, their customers still need to be convinced of the benefits. Bretzmann predicted 1990 will be the year when software distribution on CDs really takes hold.

The VMS documentation CD will cost approximately $900, according to DEC. VMS software on CD is available under maintenance contract for the identical license fee, regardless of tape or CD.

Although Ultrix is not currently available on compact disk, DEC plans to offer all of its software, including Ultrix, on CD technology. The recently announced Desktop VMS, an easy-to-install version of VMS that runs on the Decstation 3100, comes only on compact disk.

OSF wins

FROM PAGE 1

Olivetti & Co., broke ranks and voted with OSF, according to the sources. The only opponents to the proposal, they said, were AT&T, Sun Microsystems, Inc. and Prime Computer, Inc. Significantly, the X/Open board is composed of half Unix International members — which back AT&T and its Unix System V — and half OSF members. Because the vote was nonbinding, the proposal will be voted on again at the next board meeting, to be held in Tokyo in May.

At a press conference in January, Unix International backed off from its previous unconditional support of Open Look, AT&T's designated user interface. After deciding not to bundle Open Look with the upcoming release of Unix System V, Robert Kavner, president of AT&T's Data Systems Group, indicated that if Unix International members were in favor of a different user interface, then AT&T's Unix Software Operation (USO) would concede.

Larry Dooling, president of AT&T's USO, said last week that if X/Open were to make a decision in any area, USO would provide something compliant or, if generally available on the market, support that specification.

X/Open commands widespread international support and has been the point of convergence for many Unix issues. The group's endorsement of Motif is likely to solidify independent software developer support, making it unlikely that users will see a competing standard from anyone other than AT&T and its closest allies.

X/Open members contacted would not discuss details of the board meeting; however, Jim Isaak, Posix strategy director at DEC, said it is "reasonable to assume that X/Open is aggressively evaluating Motif."

Several Unix International members contacted declined to comment on their user interface plans. A spokeswoman for Unisys said the company "would rather not comment at this time, because there are a number of decisions pending."

However, Hans Koppen, manager of strategic planning at Control Data Corp., a Unix International member, said the firm intends to support OSF/Motif and as yet has no firm plans for Open Look. He said Motif would gain more widespread support by third-party software developers.

Also before the X/Open board is a proposal to adopt OSF as a full board member. An OSF membership could tip political balance in its favor.

Steve Lowen of X/Open would not comment on an OSF membership application. But one source claimed that Kavner "has taken it on as a personal project to see the group is not allowed in." Another source confirmed this, saying, "Bob Kavner is working that issue very hard."

Want to sound off, ask a question or chat with other IS professionals? The *Computerworld* bulletin board has been enhanced with an open forum for general discussion and E-mail to our staff and other bulletin board users. Call and fill out our on-line survey so we can add more features that interest you. Our modem number is (508) 626-0165.

Find Out Why ORACLE Is Ranked The Number One DBMS. Attend A Free Data Management Conference In Your Area.

CONFERENCE LOCATION _____ CONFERENCE DATE _____

NAME _____

TITLE _____ PHONE _____

COMPANY _____

STREET ADDRESS _____

CITY _____ STATE _____ ZIP _____

HOST COMPUTER(S) _____ OPERATING SYSTEM(S) _____

Your purchasing timeframe (check one):
☐ Up to 3 months ☐ 3 to 6 months ☐ 6 months to 1 year

- Learn about the fully relational DBMS that's compliant with ANSI, IBM SQL.
- Explore the productivity of 4GL & DSS tools.
- See portable applications run across micros, minis & mainframes
- Learn how CASE can end your application backlog.
- Integrate PCs & MACs with MIS.
- See the latest distributed financial applications.

ORACLE®
COMPATIBILITY · PORTABILITY · CONNECTABILITY

Call 1-800-345-DBMS, ext. 8134 today

TO RECEIVE PRIORITY RESERVATIONS AT THE NEXT FREE CONFERENCE.

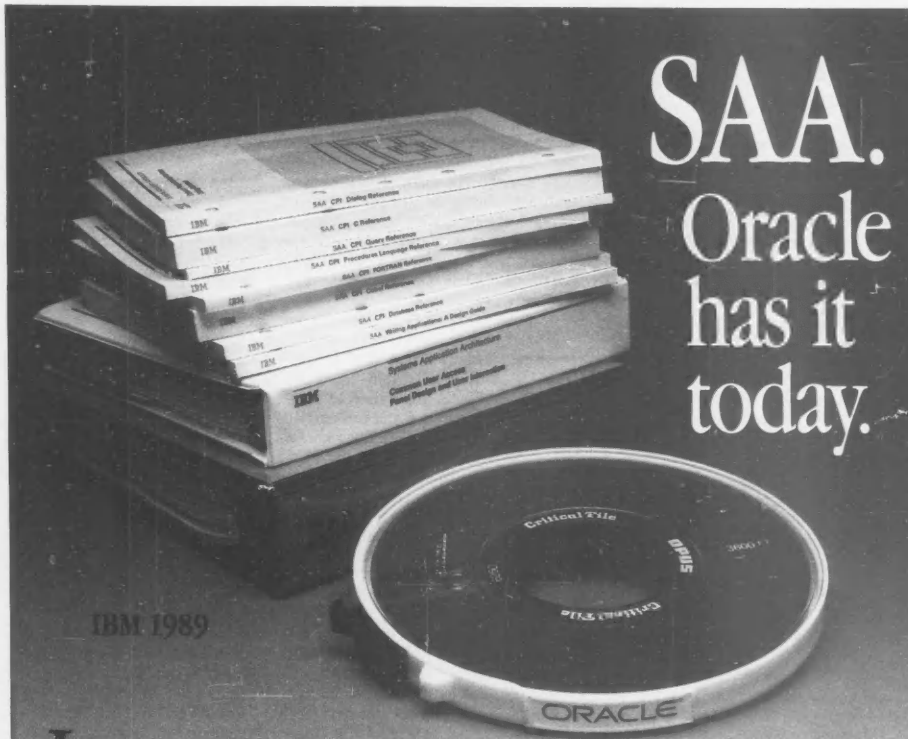
ORACLE®
Conference Invitation

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 68 BELMONT, CA

POSTAGE WILL BE PAID BY ADDRESSEE:

CONFERENCE COORDINATOR
ORACLE CORPORATION
20 DAVIS DRIVE
BELMONT CA 94002



SAA. Oracle has it today.

IBM 1989

In 1978, IBM drafted the specification for a new relational database technology called Structured Query Language, or SQL. Then, in 1979, two years before IBM delivered SQL/DS, Oracle Corporation delivered the first commercial implementation of SQL and has since become the largest database company in the world.

In 1988, IBM again produced a blueprint for the future of heterogeneous computing: Systems Application Architecture, or SAA. Oracle more than endorses this innovative vision. Oracle is delivering it. Today.

IBM's goals for SAA: "Applications that can be ported with less effort; applications that can span systems; user access to these applications that is simpler and more uniform; and programming skills that have broader applicability.[1]"

ORACLE is the only database software that runs on mainframes, minicomputers and PCs. In fact, ORACLE provides data transparency across your MVS, VM, VSE, and OS/2 environments in addition to over 80 other platforms and operating systems. Today.

ORACLE 1989
Always a step ahead.

More than just a software company

Oracle offers more than just software. We offer solutions. No other database company can offer a full suite of services including systems integration, education, consulting and the #1 customer support[2] in the industry. Which is why Oracle has become the largest database company in the world.[3]

Just as SQL was the future of data management in 1978, SAA is the future in 1988. Make an Oracle seminar part of your future, today. Call 1-800-345-DBMS to reserve your seat in the next *Oracle* seminar in your area: So you won't be somebody else's first customer, tomorrow.

U.S. SEMINAR SCHEDULE

AZ	Scottsdale	Apr 11*af* May 9 Jun 13*a*
	Tucson	Apr 18 Jun 20
CA	Costa Mesa	Apr 25*f* May 8*amw* Jun 22*f*
	La Jolla	Apr 13*a* Jun 15*am*
	Los Angeles	Apr 20*af* Apr 25*g* May 11*cm* Jun 14*amp*
	Ontario	Jun 8*cm*
	Redwood City	Apr 27*g*
	Sacramento	May 16*r*
	San Diego	May 16
	San Francisco	Apr 25*av* May 18*fi*
	San Jose	Apr 12*ar*
	Santa Barbara	May 3
	Santa Clara	May 11*cv*
	Universal City	Apr 6*cfm*
CO	Colorado Springs	May 1*t*
	Englewood	Apr 18*ac* Jun 6*fr*
CT	Farmington	Jun 15
	Stamford	Jun 8*fv*
DC	Washington	Apr 13*g* May 18*g* Jun 15*g*
GA	Atlanta	Apr 26*m*
	Savannah	Apr 27*f*
IA	Des Moines	Apr 20*t*
ID	Boise	Apr 13*fr*
IL	Chicago	Apr 18*afp* Jun 14*cf*
	Rockford	Apr 11
	Springfield	Apr 20*r*
IN	Indianapolis	Apr 25*r* Jun 7*fp*
KS	Wichita	May 4*r*
KY	Lexington	Jun 27
	Louisville	Apr 4*f*
LA	Baton Rouge	Apr 21*c*
	New Orleans	May 9*i* Jun 16*c*
MA	Boston	Apr 20*fm* Jun 6*cf*
	Burlington	Jun 13*r*
MD	Baltimore	Apr 12*cf*
	Bethesda	Jun 20*ag*[*]
ME	Augusta	Apr 18*t*
MI	Dearborn	Apr 4*f*
	Grand Rapids	Jun 6*f*
	Troy	Jun 7*af*
MN	Minneapolis	Apr 11*mv* Jun 13*af*
MO	Kansas City	May 9*c* Jun 27*f*
	St. Louis	Apr 13*v* Jun 1*g* Jun 6*f*
MS	Jackson	Apr 18*t*
NC	Raleigh	Apr 19*m*
NE	Omaha	Apr 6*f* May 30*g*
NJ	Iselin	May 11*tv* Jun 28*fr*
	Princeton	Apr 19*ar* May 17*p* Jun 14*c*
	Secaucus	Apr 19*f* Jun 1
NM	Albuquerque	Jun 7*f*
NY	Albany	Apr 18*ar*
	Binghamton	Apr 4
	Buffalo	Jun 6*fm*
	East Syracuse	Jun 15*f*
	Melville	Apr 11*am* May 10*r* Jun 13*ac*
	New York City	Apr 5*pv* Apr 19*f* May 3*t* May 17*c* Jun 14*f*
	Rochester	Apr 13*p* Jun 7*at*
	Smithtown	May 9*g*
OH	Beachwood	Apr 5*fv* Jun 13*ct*
	Cincinnati	Jun 29*mr*
	Columbus	Jun 15*c*
OK	Oklahoma City	Apr 19*c*
	Tulsa	Jun 15*r*
OR	Portland	Jun 13*apt*
PA	Harrisburg	Apr 6
	King of Prussia	May 26*c*
	Philadelphia	Apr 10*fm* Jun 19*afp*
	Pittsburgh	Jun 14*fr*
	Scranton	Apr 19*t* Jun 21*c*
SC	Greenville	Apr 13*f*
TN	Memphis	Apr 19*f*
	Nashville	May 4*f*
TX	Austin	May 11*c*
	Dallas	Apr 4*ft* May 4*afp* Jun 7*fm*
	Houston	Apr 6*cf* May 4*fr* Jun 8*fm*
	San Antonio	May 12*c*
UT	Salt Lake City	Apr 28*a* Jun 14*p*
VA	Richmond	Apr 4[*]
VT	Burlington	Apr 6
WA	Seattle	May 17*f* Jun 29*g*
	Spokane	Apr 25*f*
WI	Madison	May 18*c*
	Milwaukee	Apr 26*t* Jun 6*f*

For Canadian Seminars

Call (800) 387-4407, except in Quebec, call (514) 337-0755.

The following key indicates additional afternoon seminars that are offered with these seminar dates:

a Integrating Mainframes into Corporate Networks
c CASE Tools
f Oracle Financials
m Computer Integrated Manufacturing (CIM)
p PC Workgroup Solutions
r SQL*Reportwriter
t ORACLE Transaction Processing
v Value Added Reticensers (VARs)

Please note:

g These seminars are directed to the Federal Government only
[*] Only the indicated afternoon seminar is held on these dates

Attn.: National Seminar Coordinator
Oracle Corporation • 20 Davis Drive
Belmont, California 94002

1-800-345-DBMS, ext. 8139

☐ My business card or letterhead is attached. Please enroll me in the *FREE* ORACLE seminar to be held

at: _____

on: _____

COMPUTERWORLD

Copyright © 1989 by Oracle Corporation. Oracle is a registered trademark of Oracle Corporation. IBM is a registered trademark of IBM. Other companies mentioned own numerous registered trademarks. TRBA

ORACLE®
COMPATIBILITY • PORTABILITY • CONNECTABILITY
Call 1-800-345-DBMS, ext. 8139 today.

20 Davis Drive, Belmont, CA 94002 • World Headquarters (415) 598-8000 • ORACLE Canada (800) 387-4407 (except Quebec) • Quebec (514) 337-0755 • ORACLE Systems Australia 61-3-[illegible] • ORACLE Europe 44-1-948-6911 • ORACLE Systems Hong Kong 852-5-266846

1: IBM Journal of SAA 2: DATAPRO survey, August 1988, companies with sales over $10 million 3: Donaldson, Lufkin & Jenrette report

Fast-packet net technology ready to roll

ANALYSIS

BY ELISABETH HORWITT
CW STAFF

Fast-packet technology, which has languished for years on the drawing boards of many communications vendors, is set to burst onto the scene as the likely foundation for the next generation of high-speed intelligent networking services.

Fast-packet technology is similar to CCITT X.25 packet switching in that it takes transmissions from various user devices, breaks them up into packets and routes them over a backbone of network switches until they arrive at the right destination. However, in addition to data, fast-packet switches handle any kind of transmission — voice, video or image. They can support much higher speeds than comparable circuit and X.25 switches, with a lot more bang for the buck, industry sources said.

The industry is undergoing a surge of activity right now, with several recently unveiled alliances and products and a couple of major introductions waiting in the wings. One key upcoming announcement is a module from AT&T Network Systems that will allow carriers' existing central office switches to support fast-packet services, company spokesman Arnold Heiber said.

Such services will provide additional intelligence as well as speed, Heiber said. For example, customers will be able to allocate bandwidth to different carrier services dynamically as compared with today's circuit-switched environment, in which users must set up a specific transport link with specific hardware for each type of service, he added. This is because one general-purpose fast-packet switch has both the bandwidth and the technology to handle a wide variety of media and services. Also, the technology "allows you to put all kinds of flexible instructions in packets," Heiber said.

"I think fast-packet is strategic because it will make it easier to marry OSI . . . to T1 technology," said Stephen White, supervisor of communication and workstation technology at Chevron Information Technology Co. Chevron currently uses proprietary fast-packet T1 switches from Stratacom, Inc. "We're talking about ISDN too — which gets its strength from packet-switching technology," he said.

Chevron, an Integrated Services Digital Network user, has found it difficult and costly to get packet switching to run over the ISDN 64K bit/sec. B channel, White said. Marrying fast-packet with the ISDN standard would enable carriers to cost-effectively deliver 64K bit/sec. packet switching "all the way to the user's desk," he added.

For this to happen, fast-packet and ISDN technologies need to join hands. One hopeful sign that this will happen — LAPD Frame Relay, a protocol that could be the basis for a future high-speed, or broadband, version of ISDN — is currently in the ballot phase at the American National Standards Institute. Some vendors, including AT&T, are evaluating it for future product implementation.

Leaps and bounds

Fast-packet technology promises to provide more options and greater flexibility for user networks

Network technology	Current maximum speed	Planned maximum speed	Plans for standardized multivendor interoperability	Functions supported
ISDN	1.5M bit/sec.	100M bit/sec.	Yes	Voice, data, video, image
Traditional circuit-switched networks	45M bit/sec.	100M bit/sec.	No	Voice, data, video, image
Packet-switched networks	64K bit/sec.	1.5M bit/sec.	No	Data
Fast-packet	1.5M bit/sec.	100M bit/sec.	Yes	Voice, data, video, image

CW CHART: JOHN YORK

What we're dealing with

Past and pending introductions in the fast-packet arena include the following:

- AT&T Network Systems expects to announce soon a fast-packet module for the vendor's 5ESS central office switch.
- AT&T's research and development organization, Bell Laboratories, is said to be working on a true fast-packet switch — as opposed to an add-on module — that will use parallel processing to deliver up to a trillion bits per second.
- Telematics International, Inc. last week announced the Fastpacket Server 9000, a communications processor that is said to handle more than 10,000 voice and data packets per second. The product conforms to the LAPD Frame Relay interface and supports up to 16 T1 channels.
- Micom Systems, Inc. is expected next week to announce Fast Statmux, which will use proprietary fast-packet technology to attain a throughput that will "double, at a minimum," the throughput of any ordinary statistical multiplexer, a company spokesman said.

The cure for the batch DB2 blues

Situation Normal - All Fouled Up

Abends in DB2 batch programs are masked by the TSO Terminal Monitor Program and DSN command. Since the jobstep appears to end normally, nothing works right.

- *multi-step jobstreams don't work correctly*
- *ditto dependent job scheduling packages and abnormal dataset disposition*
- *Even SMF job accounting and charge back statistics are recorded under the wrong program name*

***DB2/Batch** solves these problems by letting you run your DB2 programs directly in batch, with regular JCL! Bottom line, DB2/Batch applications **look** and **behave** like standard OS jobs.*

***DB2/Batch** makes use of the Call Attach Facility to let you access and update DB2 data with full integrity. COBOL modules compiled with the DYNAM option will run 'as is' with DB2/Batch. Your other programs need only be (re)linked with the Host Language Interface supplied with DB2/Batch. No source changes are necessary.*

Harness DB2 in batch without the hassle! Call 212 966-0010

Relational Architects, Inc.

Showcasing ISDN applications

BY JEAN S. BOZMAN
CW STAFF

SCOTTSDALE, Ariz. — AT&T last week drew major computer vendors into its quest for MIS and telephone company support for ISDN technology.

After years of preparation, AT&T was able to showcase Integrated Services Digital Network (ISDN) applications on equipment from such mainstream vendors as Tandem Computers, Inc., Digital Equipment Corp. and Wang Laboratories, Inc.

AT&T executives demonstrated several ISDN applications — most of them directed at micro-to-mainframe connectivity and local-area networks — at the firm's Netpower seminar.

The software applications were directed at the health, education and manufacturing markets. Baxter Healthcare Corp. said its Annson Systems Division, which runs medical networks at 60 sites nationwide, developed an ISDN application for medical centers.

The Baxter application, called Annsonlink, uses AT&T's ISDN service to gather medical records into a single, permanent patient file. Compiled information can be accessed from networked personal computers, Baxter spokeswoman Gail Gulinson said.

Progressive Computing in Oak Brook, Ill., described an MIS Help desk package that gathers calls from multiple user locations — even those in an IBM Systems Network Architecture network. "You can exchange data during a voice session," said Tom Blog, Progressive's vice-president of research and development. "You can also handle multiple voice and data transactions at the same time over existing copper wire."

A third developer, The Software Link, Inc. in Atlanta, Ga., added ISDN's call-identification feature to its PC-Modular Operating System software. The software package summons up relevant data, such as a customer profile, just as a telephone call is received by a user's PC modem.

Targeting marketing efforts at local phone companies and regional holding companies, AT&T executives said those carriers must buy into the ISDN concept before end users see ISDN products offered as value-added information services.

Despite the demonstrations, most applications are still on the drawing boards, including applications now being developed by DEC and IBM. At the last minute, IBM declined to appear at the Netpower showcase, AT&T said.

AT&T is not ruling out further improvement in bandwidth, which would bring about an era of broadband ISDN. But AT&T had no comment on how many years away high-speed ISDN may be.

More power to the people.

ORACLE has led a revolution in PC relational database technology. More power. More portability. More connectivity. More reasons than ever to make ORACLE your corporate standard database.

PC MAGAZINE EDITORS' CHOICE

New tools with even more power.

We're proud to announce our newest release—Professional ORACLE Version 5.1B. Now you can run your applications in OS/2 or in protected mode above 640K in MS-DOS. So you have more room for more powerful applications. And those same applications run unmodified on almost all workstations, minicomputers and mainframes.

Version 5.1B delivers a new level of power to your PC developers including the latest versions of:

- **SQL*Forms®** NEW! Enhanced 4th-generation application development environment.
- **SQL*Menu®** NEW! Flexible interface builder for defining complex menu systems.
- **SQL*ReportWriter™** NEW! Nonprocedural development and runtime powerhouse for producing any report.
- **SQL*Plus®** Oracle's ANSI-standard SQL query and administration tool.
- **Pro*C™** The C-language precompiler and subroutine call interface to ORACLE.

Learn SQL on us.

Learn the language of the revolution. Order Professional ORACLE today for $1299 and we'll include ORACLE SQL*Tutor, a nine-module PC-based SQL instruction program that sells by itself for $199.

Try ORACLE for $199.

Our Trial Version is identical to Professional ORACLE, but can't be used in networked configurations and allows a maximum user database size of 1 MB. It's a powerful tool for prototyping your first ORACLE application. And its price can be applied to the purchase of a full Professional ORACLE license.

Money-back guarantee.

If you haven't tried ORACLE yet, now there's even more reason to join the SQL revolution. More tools. More power. If ORACLE 5.1B doesn't revolutionize the way you develop PC database applications, return it within 30 days for a full refund.

Call 1-800-ORACLE1 ext. 8131, or an ORACLE MasterVAR today.

ORACLE®
COMPATIBILITY · PORTABILITY · CONNECTABILITY
Call 1-800-ORACLE1, ext. 8131 today.

Copyright © 1989 by Oracle Corporation. ORACLE, SQL*Forms, SQL*Menu, SQL*Plus and SQL*Report are registered trademarks and Pro*C and SQL*ReportWriter are trademarks of Oracle. Also trademarks: MS of Microsoft, OS/2 of IBM. TRBA

Dear Oracle

Oracle Direct • 20 Davis Dr. • Belmont, CA 94002
1-800-ORACLE1, ext. 8131

Since your 30-day money-back guarantee eliminates any risk on my part, please send me the software below. Enclosed is my ☐ check, or ☐ VISA ☐ MasterCard ☐ AmEx credit card authorization. Offer valid only in the USA.
Please send ☐ 5.25" High Density or ☐ 3.5" disks.

☐ Professional ORACLE for MS-DOS with free ORACLE SQL*Tutor for $1299 ..... $_____

☐ Professional ORACLE for MS-DOS Trial Version for $199 ..... $_____

☐ Professional ORACLE for OS/2 for $1299 ..... $_____
Professional ORACLE Requirements: MS-DOS—80286/80386 PC with MS-DOS V3.1+, hard disk, 640KB of memory and 896K extended memory required. 2.5MB of extended memory recommended (required for SQL*ReportWriter). OS/2—80286/80386 PC w/ OS/2 V1.0, hard disk, 3MB memory. SQL*ReportWriter not available for OS/2 and is replaced by SQL*Report®

☐ Just send ORACLE SQL*Tutor for $199 ..... $_____
Minimum Requirements: 256K PC with hard disk. Color monitor suggested.

Subtotal ..... $_____

Please add appropriate sales tax ..... $_____

Total enclosed/authorized (USA only) ..... $_____

NAME TITLE

COMPANY

STREET (no P.O. boxes, please)

CITY STATE ZIP

PHONE

CREDIT CARD NO. CARD EXPIRATION DATE

SIGNATURE TODAY'S DATE COMPUWORLD

TRW picks up Chilton

Deal boosts firm to 40% presence in credit bureau industry

BY MITCH BETTS
CW STAFF

TRW, Inc. won federal approval last week to acquire Chilton Corp., a merger that will increase TRW's power in the credit-reporting industry and reduce the number of vendors with national credit databases from four to three.

The $330 million business transaction between the two national credit networks will be completed this week, a TRW spokeswoman said. The proposed acquisition raised antitrust concerns, but the U.S. District Court in Cleveland last week approved an antitrust settlement between TRW and the U.S. Department of Justice.

The three remaining vendors of data processing services for credit bureaus will be TRW Information Services Group, based in Orange, Calif.; Credit Bureau, Inc., an Atlanta-based subsidiary of Equifax, Inc.; and Trans Union Credit Information Co. in Chicago.

The TRW-Chilton merger gives TRW a roughly 40% market share, according to one account. Historically, TRW's strength has been on the East and West Coasts, while Chilton's strength has been in the Midwest. Chilton, which is a subsidiary of Borg-Warner Corp., is based in Dallas.

The Justice Department initially objected to the merger on grounds that it would reduce competition in 16 geographic markets in which TRW and Chilton are the main competitors. But in November, the department and TRW negotiated a settlement that allows the merger under the condition that TRW either cancels its affiliation with local credit bureaus in those 16 markets or sells its local database to another vendor entering the local market.

The financial and retail industries that buy the on-line credit reports did not raise any objections to the merger. In fact, the users said that a reduction of credit-reporting networks from four to three would be beneficial because it would give them more comprehensive credit data while preserving adequate competition, the Justice Department reported.

However, some local credit bureaus did oppose the deal because the consent decree requires them to cancel their successful affiliations with TRW or Chilton and align themselves with a less-established vendor in their local markets.

In addition, they complained that the merger will eliminate the fourth vendor of data processing and network services. The national vendors store, process and transmit credit data that is collected and sold by local affiliated credit bureaus.

Carving from the top

CLEVELAND — TRW, Inc. has eliminated the position of Richard Koeller, vice-president of information services, in a continuation of its strategy to shrink its corporate information systems staff.

Koeller, still on-site at TRW, said last week he is seeking a new position either within TRW or elsewhere. He joined the manufacturing and services conglomerate eight years ago as director of IS for the aircraft components group and has been a top IS executive there since 1985.

Koeller said his position's elimination is part of TRW's decentralization and consolidation of IS as well as other corporate functions. In the aircraft components group, for example, all six operating divisions were sold within the past two years. At the beginning of this year, Koeller's staff had been downsized from a peak of 220 people to 85.

"If they're changing their strategies, that's fine. I'll be looking for challenging assignments elsewhere," Koeller said last week. "I'm very upbeat."

Koeller declined to comment on who would be considered TRW's top IS executive after his departure.

CLINTON WILDER

Sara Lee

CONTINUED FROM PAGE 1

thought five years ago and made hard rules out of it, you could have a problem."

The closing of Sara Lee's corporate data center was one of the first actions taken by John H. Bryan Jr. when he became chairman in 1976. "We have a very strong corporate philosophy of decentralization," said Michael E. Murphy, Sara Lee's executive vice-president and chief financial officer. "It didn't make sense for us to be holding the operating unit presidents responsible for their own profitability, yet forcing the cost [of corporate IS] down their throats."

At Sara Lee's corporate offices overlooking Chicago and Lake Michigan, there are almost as many PCs as people, Murphy said. The 250 PCs and one Digital Equipment Corp. VAX are enough to basically handle all corporate applications.

The decision to close the data center was not based on any insight "into what would happen 10 years later with distributed processing," Murphy added. "We just thought it was the best way to run the business."

Swoyer hosts an annual meeting of IS managers from all units so they can find common ground among themselves, whether it is shared hardware architectures or business problems. For example, in the packaged meats division, which includes the Jimmy Dean, Kahn's and Hillshire Farm brands, 19 units agreed last year to standardize on the IBM Application System/400.

"We formed a subcommittee of the strongest MIS guys in the division to answer the question, 'Would a single architecture make sense?' " Swoyer said. "The answer was yes. We figured we will save $2 million in just one of our companies over four to five years."

Swoyer describes Sara Lee's centralized corporate IS functions as "thinking, research and planning. To justify a corporate data center, more and more firms have to run an operating division's computing in it," he said. "We don't need a lot of computing here."

Companies in several different industries have come to similar conclusions:

- American Express Co., a $23 billion financial services giant, has a corporate IS staff of exactly nine people. Those staffers call themselves "technological consultants." [CW, Dec. 12, 1988].
- Last year, Kendall Co. closed its IBM 3084-based corporate data center in favor of AS/400-based processing in each of its five divisions [CW, Feb. 20].
- The main function of corporate IS at Cox Enterprises, Inc.'s Atlanta headquarters is to collect and consolidate financial and human resources information; the only CPU required there is a Hewlett-Packard Co. minicomputer. All other activities, including setting standards and acquiring equipment, are handled by the individual MIS directors in Cox's cable TV, newspaper, automobile auction and commercial broadcasting divisions.

In addition to the need to push applications out to the business units, firms are also reacting to the need to cut costs — and a corporate data center and staff is not cheap. "With the merger and acquisition mania, you have to get rid of overhead," Swoyer said. "Smaller is very appealing to top management these days."

"THE INFORMATION systems executive function "is like driving a car. The computing activity, like the car engine, is running somewhere else, not where you're sitting."

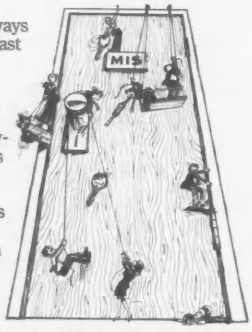
VINCENT H. SWOYER
SARA LEE

Unlocking mainframe resources: spreadsheets.

Why should you be in a crunch just because your end users need numbers yesterday?

Your overworked DP staff can't always download end user spreadsheet data fast enough to meet the demand.

But now there's a way out of the numbers crunch: the Trax Electronic Spread Sheet (ESS®). It makes file downloading a thing of the past by giving end users direct, controlled access to spreadsheet data from your IBM mainframe.



ESS is the key. ESS spreadsheets are limited only by mainframe capacity. Windows let end users view data in just about any combination. There's online help, 3-D spreadsheets, integration of PC spreadsheet data, even macro processing.

And anyone who knows the more popular PC spreadsheet packages already knows ESS. For real flexibility, use ESS with EdWord,® the Trax word processing program, to integrate numbers and text.

Trax is the key. Join the more than 500 companies using Trax products around the world. Contact Tom Cox, 10801 National Blvd., Los Angeles, CA 90064. FAX: (213) 470-2487. Telex: 350048. Telephone: **(213) 475-TRAX.**

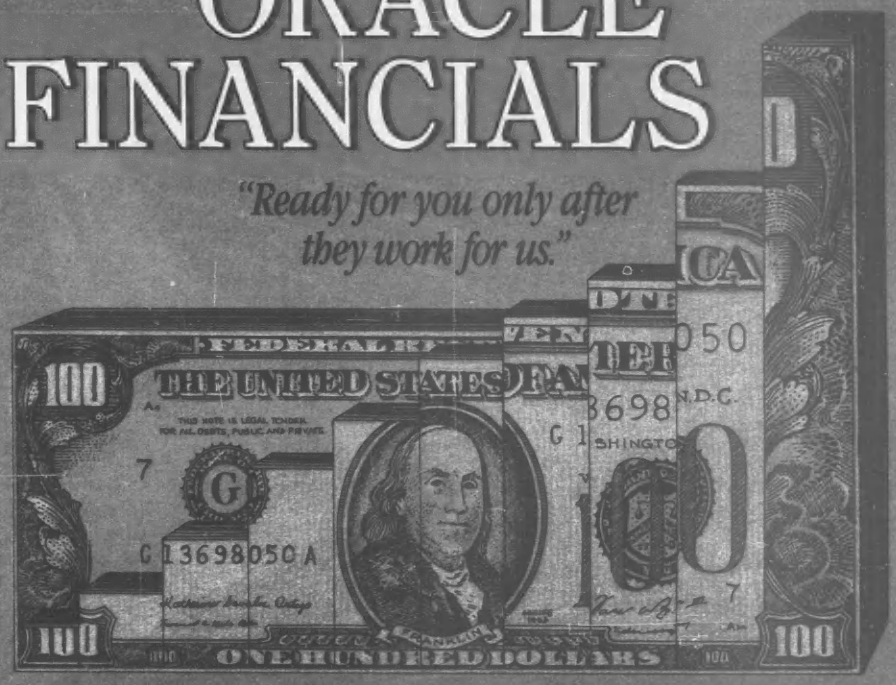
ESS and EdWord are registered trademarks of Trax Softworks, Inc.

Trax Softworks, Inc. Unlocking end user productivity on your IBM mainframe.

Announcing

ORACLE FINANCIALS

"Ready for you only after they work for us."



Oracle Financials

Oracle General Ledger,™ Oracle Payables,™ Oracle Purchasing™ and Oracle Assets™ applications have world-class functionality, yet are so easy to use that you may not bother to read documentation. Not only can they do anything you need to do, but they do it effortlessly and on the computer of your choice — mainframe, minicomputer or workstation — at the location of your choice.

"...Oracle Financials seems too good to be true. They offer full-featured accounting capabilities... without having to write any applications."
— Howard Fisher, Treasurer, Tootsie Rolls

The best software quality control in the world

"By being the very first production user, Oracle demonstrated their absolute confidence in the financial software they intended to sell. This quality control alone makes Oracle Financials worth a close look."
— David Thomas, Hambrecht & Quist

In three years, Oracle's sales grew from $25 million to almost $300 million. They went from 1000 customers to over 10,000, from 7 products to over 100, from $15 million in total assets to over $250 million with several major corporate reorganizations along the way. Oracle Financials were there every step of the way.

"Oracle Payables is one of the few packages we evaluated that can really deal with the demands of a very large company. And by being able to implement Oracle Financials on our existing minicomputers, we saved $500,000 over the cost of other alternatives."
— Michael Prince, Data Processing Manager, Burlington Coat

"The flexibility of Oracle Financials lets us focus on our company's growth, not our accounting systems. Whatever your industry, whatever the size of your company, we are certain that these products will work for you. We invite you to attend the next Oracle Financials briefing and demonstration in your area."
— Jeffrey L. Walker, Senior VP, CFO Oracle Corporation

ORACLE

Call 1-800-345-DBMS, ext. 8110 today.

Copyright © 1988 by Oracle Corp. Oracle Financials, Oracle General Ledger, Oracle Payables, Oracle Purchasing and Oracle Assets are trademarks of Oracle. TR61

Oracle Financials Seminars

AZ	Scottsdale	Apr 11
CA	Costa Mesa	Apr 25 Jun 22
	Los Angeles	Mar 14 Apr 20
	Ontario	Mar 21
	Sacramento	Mar 21
	San Diego	Mar 16
	San Francisco	Mar 29 May 18
	Santa Clara	Mar 9
	Universal City	Apr 6
CO	Englewood	Mar 7 Jun 6
CT	Farmington	Mar 7
	Stamford	Mar 21 Jun 8
FL	Tampa	Mar 22
GA	Savannah	Apr 27
HI	Honolulu	Mar 14
ID	Boise	Apr 13
IL	Chicago	Feb 28 Mar 21 Apr 18 Jun 14
IN	Indianapolis	Mar 22 Jun 7
KY	Louisville	Apr 4
MA	Boston	Apr 20 Jun 6
	Burlington	Mar 15
MD	Baltimore	Apr 12
	Columbia	Mar 15
ME	Portland	Mar 2
MI	Dearborn	Apr 4
	Grand Rapids	Mar 8 Jun 6
	Troy	Mar 7 Jun 7
MN	Minneapolis	Mar 14 Jun 13
MO	Kansas City	Jun 27
	St. Louis	Mar 9 Jun 6
NE	Omaha	Apr 6
NJ	Iselin	Mar 30 Jun 28
	Princeton	Mar 15
	Secaucus	Mar 2 Apr 19
NM	Albuquerque	Mar 7 Jun 7
NV	Las Vegas	Apr 27
NY	Buffalo	Jun 6
	East Syracuse	Jun 15
	Melville	Mar 15
	New York City	Feb 22 Apr 19 Jun 14
OH	Beachwood	Apr 5
	Cincinnati	Mar 23
	Columbus	Mar 9
OR	Portland	Mar 14
PA	Philadelphia	Apr 10 Jun 19
	Pittsburgh	Mar 15 Jun 14
SC	Charleston	Mar 9
	Greenville	Apr 13
TN	Memphis	Apr 19
	Nashville	May 4
TX	Dallas	Mar 7 Apr 4 May 4 Jun 7
	Houston	Mar 9 Apr 6 May 4 Jun 8
WA	Seattle	Feb 21 May 17
	Spokane	Apr 25
WI	Madison	Feb 22
	Milwaukee	Mar 8 Jun 6

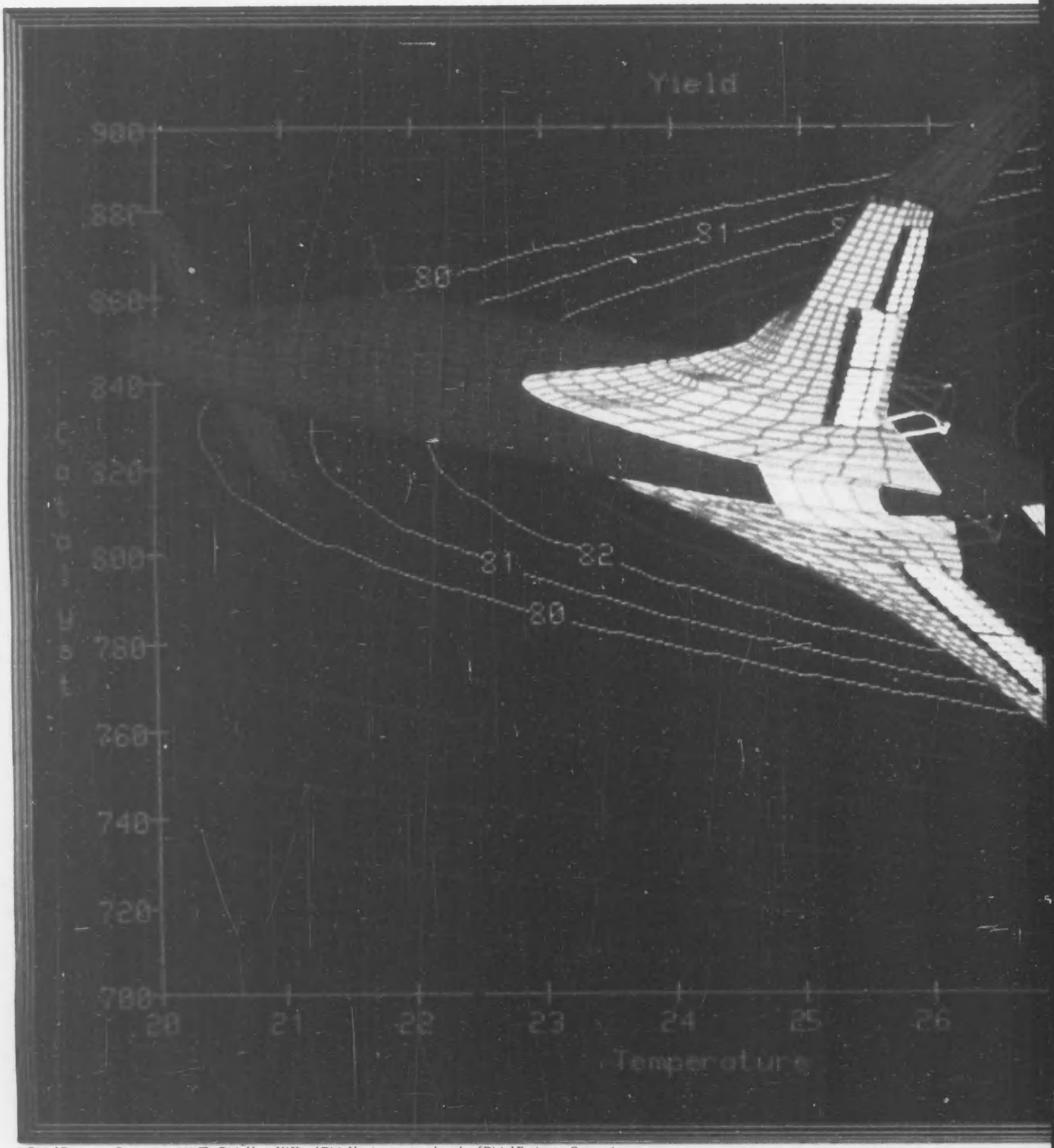
Attn: National Seminar Coordinator
Oracle Corporation
20 Davis Drive
Belmont, California 94002
1-800-345-DBMS, ext. 8110

☐ My business card or letterhead is attached. Please enroll me in the *FREE* Oracle Financials seminar to be held

at: _____

on: _____

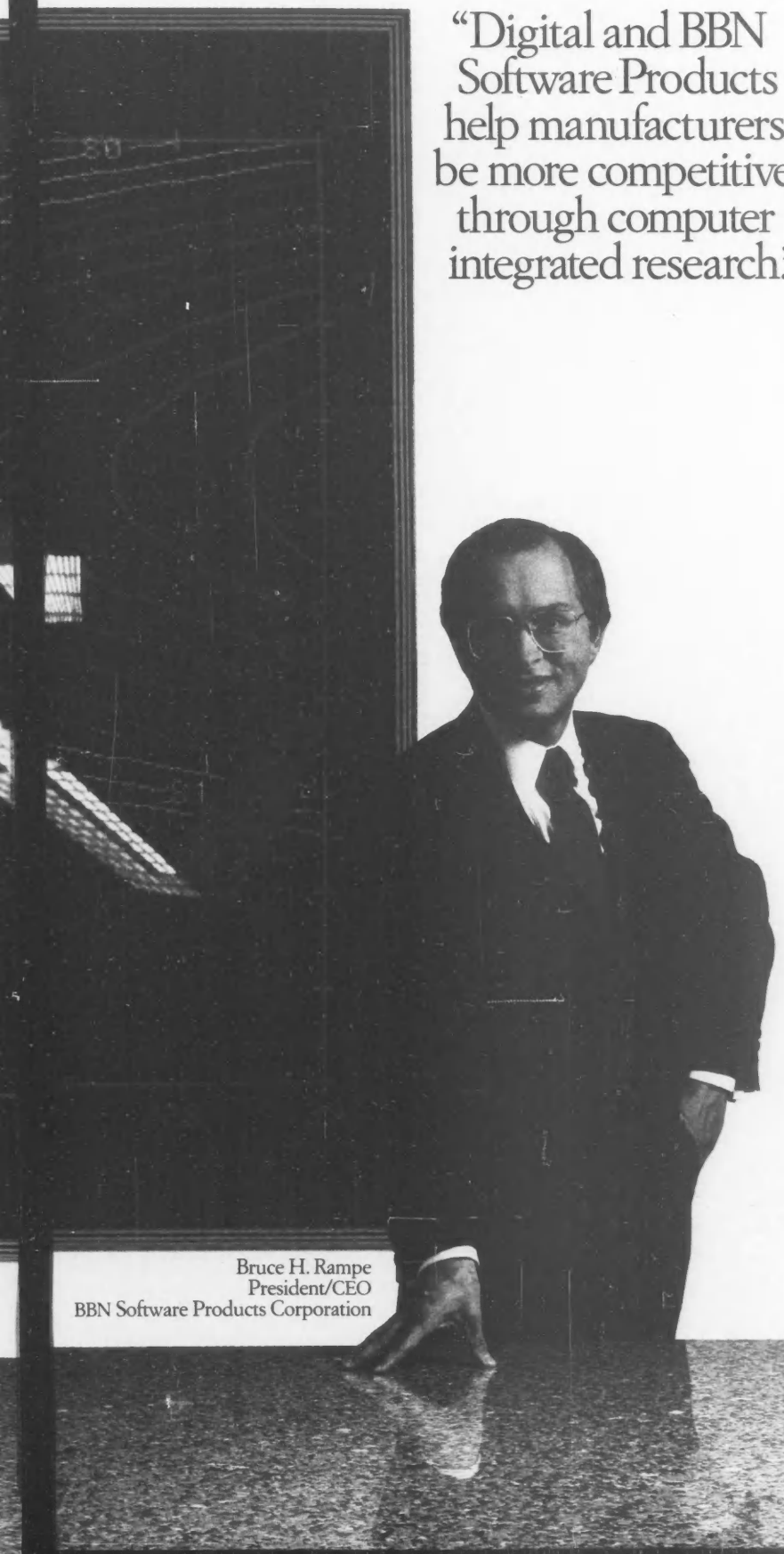
COMPUTERWORLD



© Digital Equipment Corporation 1989. The Digital logo, VAX and Digital has it now are trademarks of Digital Equipment Corporation.

digital™

"Digital and BBN Software Products help manufacturers be more competitive through computer integrated research."



Bruce H. Rampe
President/CEO
BBN Software Products Corporation

"To stay competitive, our customers must collect and analyze vast amounts of data in their research laboratories and manufacturing facilities. Digital's distributed, networked desktop computing approach combined with BBN's RS-based family of software products lets scientists, engineers, and manufacturing people share data throughout the company.

"With Digital, we help companies do things now they wouldn't have considered years ago. Now, research and development people can, from their desks, electronically troubleshoot manufacturing problems in plants hundreds of miles away.

"Digital's networking and VAX™ systems provide individual researchers with the sophisticated tools they couldn't afford if they were working in isolation. By sharing information, researchers can more easily find the answer that's hidden in the data.

"Digital is the clear leader in our prospective markets. Their future direction will maintain that leadership, and we'll be right along with them."

The rewards of working together.

Digital's approach to desktop computing and networking is the most flexible, cost-effective means toward the total integration of your workplace.

Today, with more networks than anyone else, Digital gives you an elegantly simple way for your people to work together more productively, more creatively, more efficiently, more competitively.

To learn more, write to Digital Equipment Corporation, 200 Baker Avenue, Concord, MA 01742-2190. Or call your local Digital sales office.

A way to work together like never before.

Digital has it now.

Cornell delays release of virus report

BY MICHAEL ALEXANDER
CW STAFF

ITHACA, N.Y. — Cornell University officials have completed a lengthy report that details how the university's computers were used to inject a worm into the Internet computer network last November but have delayed publicizing the finding pending any criminal action.

The report will not be made public until after the U.S. attorney here decides whether to charge Robert Morris Jr., the Cornell computer science graduate student believed to have masterminded the worm attack, university officials said last week.

"My hope had been to release this report in full after I had an opportunity to review it," Robert Barker, Cornell University's provost, said in a prepared statement.

"However, based on discussions with university counsel and at the specific request of the U.S. attorney and the attorney for Mr. Morris . . . I have decided to delay release of the report until the U.S. attorney decides the legal actions he intends to pursue in this matter," Barker said. "At that time, the report and all of its appendices will be made available for public inspection."

Barker also said that he would reconsider March 31 whether to release the report if Frederick Scullin, the U.S. attorney here, has not announced what legal action he intends to take. "I fully appreciate that the scientific community deserves to know of the findings of the investigation," he said.

No comments

Morris could not be reached for comment. He is on a leave of absence from Cornell and is reportedly staying at his parents' home in Arnold, Md.

Thomas Guidoboni, a Washington, D.C., attorney representing Morris, confirmed that he wrote a letter to Cornell University legal advisers expressing concern that the report, if it placed the blame on Morris, would influence his right to a trial with an impartial jury. "While I did not see the report, my view was that it might be prejudicial to Morris," Guidoboni said. "Apparently, the U.S. attorney had concerns as well."

Scullin and U.S. Department of Justice officials in Washington, D.C., did not return telephone calls seeking comment on the case.

Cornell's report, which is between 160 and 200 pages including appendices, was compiled by a committee of university officials headed by Stuart Lynn, vice-president of information technologies. "It goes into the involvement of Cornell's computers, the role that Morris is alleged to have played, Unix security and other issues related to networks," said Dennis Meredith, a university spokesman.

Action to come

A university disciplinary board will determine what actions, if any, it will take against Morris after the report is released, Meredith said.

Justice Department officials are reportedly divided on whether to allow Morris to plead guilty to a misdemeanor or to prosecute him on more severe charges as a deterrent to computer crimes [CW, Feb. 6].

"If the U.S. attorney [in Syracuse] had a clear view of this case, he would have made a decision by now," Guidoboni said.

The decision will be made by Justice Department officials in Washington, D.C., he added: "They are the ones who are dragging their feet. They are more interested in getting robbers and dope sellers; that is more important than getting Robert Morris. He is not some criminal kingpin. Robert would like the issue to be resolved, but I am not surprised that it would take this long."

TV news execs ousted after hacking charges from rival

BY MICHAEL ALEXANDER
CW STAFF

TAMPA, Fla. — A Florida television station fired two news executives in the wake of reports that one of them allegedly penetrated a rival station's computer system and stole sensitive competitive information.

WTSP-TV (Channel 10), an ABC affiliate in St. Petersburg, announced last week that it had fired Assistant News Director Michael Shapiro and News Director Terry Cole.

Shapiro was arrested Feb. 7 on felony charges for allegedly breaking into a computer system at WTVT-TV (Channel 13) on at least six occasions in January [CW, Feb. 13]. He was once employed by WTVT as an assignment manager and was responsible for administering the station's computer systems.

Law enforcement officials seized from Shapiro's home a personal computer, 200 floppy disks and an operating manual and user guide for software used at the rival station.

He has been charged with 14 felony counts under Florida Statute 815, which covers computer-related crimes. Each count carries a maximum sentence of 15 years and a $10,000 fine.

Vince Barresi, WSTP's vice-president and general manager, refused to comment on the two firings. However, in a prepared statement, he said that he told viewers during an 11 p.m. newscast last Tuesday that the station acted to "avoid any questions about the objective way we do our business in keeping the public informed."

Cole, who hired Shapiro last September, has not been charged by Florida law enforcement officials. He was fired, according to one source, because as director of the news room operations, he is held ultimately responsible for the actions of news staffers.

Shapiro and Cole were unavailable for comment.

Hacker pleads guilty to computer violations, is denied bail by judge

BY J. A. SAVAGE
CW STAFF

LOS ANGELES — Kevin David Mitnick, the hacker deemed too dangerous to be let out on bail, pleaded guilty to two criminal counts last week.

In early January, Mitnick was detained under strict measures at the request of prosecutor Leon Weidman, who asked the court to view him as a risk and a danger to the public. The U.S. Attorney's Office asked the court to deny him access to telephones for fear he may have preprogrammed a computer to trigger programs with a phone call, according to Weidman.

Mitnick pleaded guilty to two counts: computer fraud, for entering Digital Equipment Corp.'s computer system, and breaking federal law by having more than 16 unauthorized phone access codes.

Under the original indictment, which included defrauding MCI Communications Corp. and transporting stolen information across state lines, he faced 30 years in prison. Mitnick pleaded not guilty to the original charges in January.

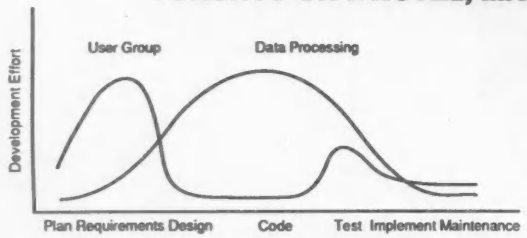
Exchange proposed

Both the U.S. Attorney's Office and Mitnick's lawyer agreed that in exchange for the plea, Mitnick would serve one year in jail and three years of probation, according to a spokeswoman for the U.S. Department of Justice. They are recommending that the court follow the agreement. Mitnick is scheduled for sentencing in late April.

The bargain was struck after it was determined that damages to DEC, including downtime and searching for the intruder, amounted to between $100,000 and $200,000, not the entire $4 million originally identified in court documents, according to the spokeswoman.

While still in jail awaiting sentencing, Mitnick will be allowed to use telephones without direct supervision, a privilege he was denied while being held since his early December arrest [CW, Jan. 9].

JOINT APPLICATION DESIGN (JAD IBM™)
TEN YEAR ANNIVERSARY CONFERENCE
TORONTO CN L'HOTEL, MAY 11-12, 1989



Tony Crawford is pleased to announce the tenth anniversary of Joint Application Design. In celebration of the introduction of this enduring concept in May 1979, Tony will host a conference devoted to quality business analysis and system design in a structured workshop.

All you wanted to know about JAD but were afraid to ask.

Speakers will present the results of **JAD** experience and explain their approach to exchanging business views and system scenarios for real improvements in productivity and system quality.

The conference will be chaired by Bill Harmer of Imperial Oil Canada and will take place in downtown Toronto at the outstanding CN L'Hotel.

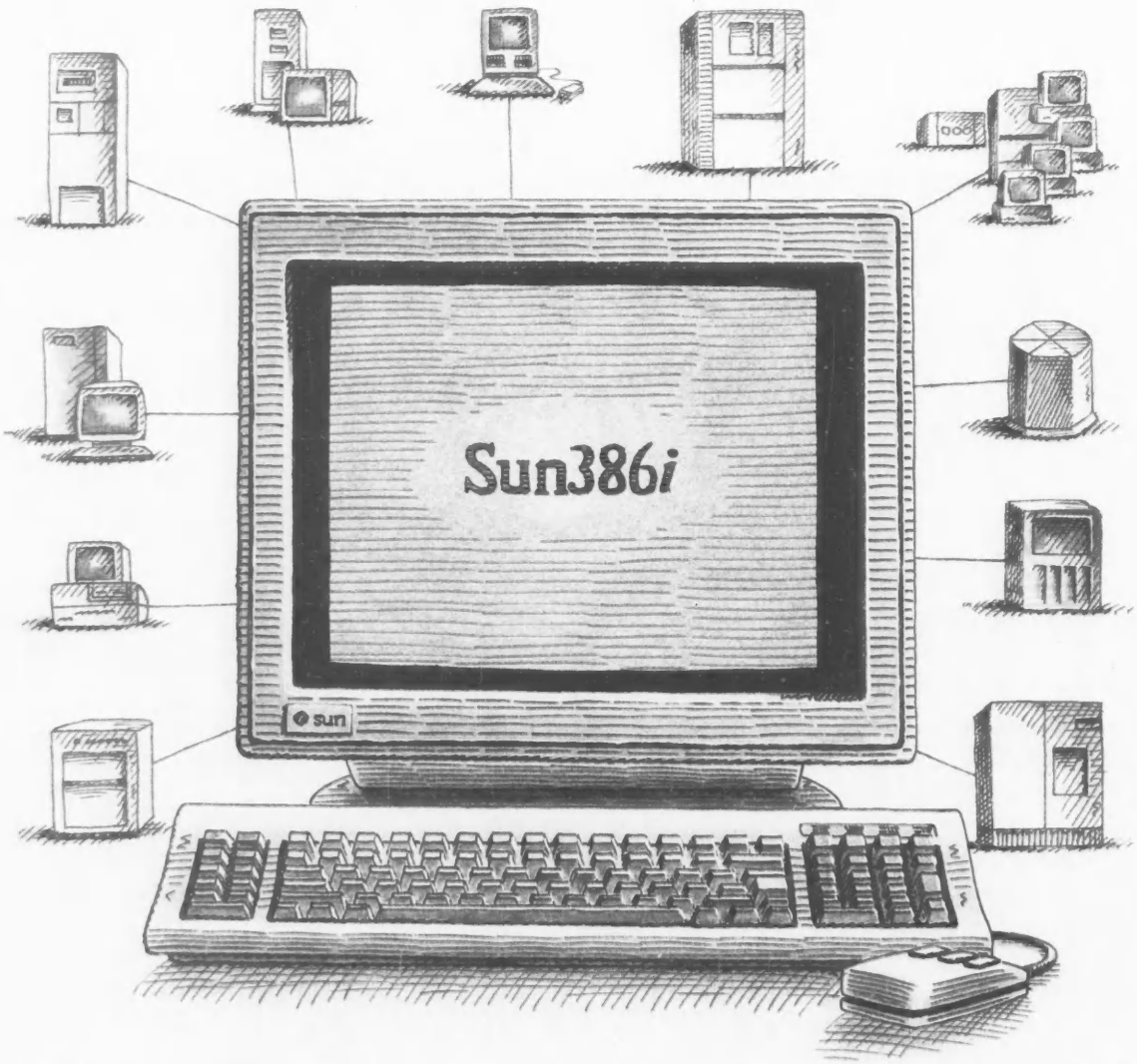
Tickets will be available to business managers and system partners for CDN $950.00/US$840 for two. Sincere excuses will be considered for single attendance for half the fee.

Call Tony Crawford or Jill Crawford for enrollments and accommodation details at 416-845-3844 or FAX 416-849-0252.

JAtec Designer Systems

OS/2 promises you the moon.

But it'll ne
everything u



© 1989 Sun Microsystems, Inc. Sun386i, Sun and Systems for Open Computing are trademarks and Sun Microsystems and the Sun Logo are registered trademarks of Sun Microsystems, Inc. UNIX is a registered trademark of AT&T. All other products or services mentioned are identified by the trademarks of their respective organizations.

ver give you nder the Sun.

You're looking at a total eclipse of the moon.

Namely, the Sun386*i*™ workstation.

Whatever OS/2 does, the Sun386*i* with UNIX® does better.

Which is not a pie-in-the-sky promise, but a down-to-earth fact.

While the OS/2 operating system limits your network horizons primarily to fellow PCs, the UNIX operating system on the Sun386*i* opens them to the world.

Mainframes, minis and personal computers of every shape and size.

So not only can you save all the IBMs, DECs and Apples you've ever bought, you can effectively tie them all together right on your desk.

And if that's not enough to make you thank your lucky stars, there's this:

You don't have to give up one bit of DOS.

In fact, you can make more out of it.

Whereas with OS/2, you can run just one DOS program at a time. With the Sun386*i*'s multitasking, you can run all sorts of DOS and UNIX programs at the same time.

Say you're working on currency trading figures under UNIX, you can update your Lotus® 1-2-3® spreadsheet under DOS. Make a Harvard Graphics™ slide show under DOS. Cut and paste results of all three into a sophisticated publishing package under UNIX. And E-mail it to the coast.

Simultaneously.

Far out, you say?

Not really. Well within reach.

Because you can forget the UNIX hieroglyphics of yesteryear. The Sun386*i*, with its point-and-click interface and Hypertext help system, is easier to use than most any personal computer.

And it'll no longer take you a sidereal year to figure out how to plug into your corporate network. In this solar system, it's a 30-minute job.

After all, the Sun386*i* is just part of Sun's concept of Open Computing. A corporate-wide universe of truly distributed computing based on industry standards. Something out of sight for OS/2.

Which just goes to show you.

Once you look at the moon, you'll see how much the Sun really shines.

To find out more, phone 1-800-223-6736. In California 1-800-322-6736.

sun microsystems

Systems for Open Computing.™

EDITORIAL

Fund education

THE EVIDENCE OF looming and possibly severe imbalances in the supply-demand equation in the information system labor market rapidly builds.

Barring any severe growth disruptions in the U.S. or world economy, which are not likely, we will see the development of a sellers' market characterized by chronic shortages of IS professionals as well as upward pressure on salaries.

Consider this evidence:

• Last week, *Computerworld* noted that in U.S. postgraduate schools, foreign students make up a growing percentage of graduate MIS programs. At many schools, foreign students, most of whom return to their native lands, are a clear majority of the MIS doctoral students. It is from this group of graduate students that tomorrow's university MIS professors are derived.

• *The Boston Globe* published a study last week that showed a steady, precipitous decline in the numbers of undergraduate students enrolling in computer science and computer engineering programs at Boston area schools such as MIT and Northeastern University. At Northeastern, for example, enrollment in computer science has declined 31% in four years.

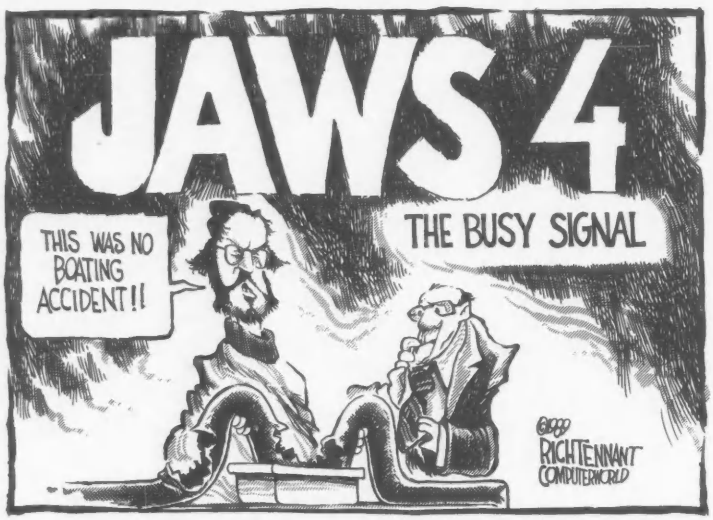
• The following headlines have appeared in the business press in recent weeks: "Census predicts U.S. population drop in next century"; "America's looming shortage of labor"; "U.S. labor supply shrinking."

That's a taste of supply-side labor. Now consider the demand portion of the equation. According to the U.S. Department of Labor's statistics, the number of U.S. workers performing software programming has risen 60% during the past four years. Given that the widespread availability of software engineering tools is at least five years distant, the demand for programmers will continue to rise unabated for the foreseeable future, as will the demand for people to manage programming teams.

And consider the most important factor: Education and training resources from both the public and private sectors are going to be increasingly earmarked to somehow retrofit today's burgeoning numbers of young people that graduate from high school but can't tell you in what century the Civil War was fought. Bear in mind that in a recent major study, U.S. students finished dead last behind such countries as Spain and Ireland in a comparison of math and science scores.

Clearly this is a problem of national consequence and must therefore be dealt with on the national level. Instead, in recent years, a combination of federal cuts to higher education and tax limitation initiatives in many states has turned back the clock on progress in education.

Of all the campaign promises made by President Bush, the one he absolutely must fulfill is to become the "education president." But that's done with money, not with campaign rhetoric. We're all awaiting a sincere effort to match the promises with the tough decisions needed to make them a reality.



NEWS ITEM: TRANS-ATLANTIC COMMUNICATIONS CABLE VULNERABLE TO DISRUPTION BY SHARK ATTACKS.

LETTERS TO THE EDITOR

AI is no worm

Having read Harvey Newquist's "Benchmarking Brainiac 1000" [CW, Feb. 27], I am writing in the sake of fairness to artificial intelligence.

The statement that "today's products can compete head-to-head with a level of intelligence on par with a worm" is not only unfair but also irrational. The fact that AI has not yet delivered what many people were promised is not AI's fault. The blame is on those who tried to prematurely commercialize it and sell it aggressively before its time.

Let's not forget that it took thousands of years for the "natural intelligence" of human beings to reach its present stage. AI is only 40 years old or so; thus, to somehow expect it to deliver results comparable to our human intelligence is not only unrealistic but borderline foolish.

The level of "intelligence" of today's AI (and its offsprings expert systems and neural nets) is much closer to that of a human than a worm. There are already several successful systems out there that are not only quite useful to humans but also capable of becoming more intelligent.

Gus A. Galatianos
President
Advanced Computer Consulting, Inc.
Whitestone, N.Y.

Britton Lee serves

Regarding "Client/server not delivering" [CW, March 6], Britton Lee, Inc. pioneered the client/server architecure and has shipped more than 1,000 relational database servers based on that architecture to 400 customer sites since 1981.

Britton Lee systems allow a heterogeneous computer environment to share common data that is centrally located on the Britton Lee Sharebase system. The system currently supports IBM PC-DOS and VM/CMS; AT&T Unix System V; Digital Equipment Corp. VAX/VMS and Ultrix; Sun Microsystems, Inc. Unix; Apollo Computer, Inc. Aegis/Domain; and Pyramid Technology Corp. OSX.

Britton Lee is now shipping SQL-based server systems with capacity up to 100G bytes, running in production-oriented applications in Fortune 500-size companies worldwide. It is not theory, as the author states, but reality that "users can run their favorite applications while transparently accessing the power of shared relational databases."

Scott R. Humphrey
Director,
Corporate Communications
Sharebase from Britton Lee
Los Gatos, Calif.

This week in history

March 19, 1979
The first bill to rewrite the 1934 Communications Act to gradually regulate full competition in the U.S. telecommunications industry goes to the U.S. Senate.

"Natural monopoly and economy of scales are ideas of the past. Competition and diversity are the future," says Sen. Ernest F. Hollings (D-S.C.), who sponsored the bill.

March 19, 1984
Gould, Inc.'s Computer Systems Division announces its first virtual memory processor, a 32-bit machine that supports Unix and targets Digital Equipment Corp.'s VAX-11 market. The Powernode 6000 is designed for networked and stand-alone multiuser applications.

Pick of the litter

Regarding the article on relational database management systems in the Product Spotlight section [CW, Feb. 27], I am constantly amazed at what seems to be an intentional ignoring of the Pick operating system. This RDBMS has probably survived longer than any other!

I have worked for firms that run 300 to 400 retail stores and use Pick to distribute their entire product line and communicate with all stores for daily inventory and sales updating.

I believe it was 1979 when guru James Martin was informing computer professionals of the best database management system . . . Pick. If you would make the effort to research, you would discover that it has through the years maintained its standard of excellence. Oh, by the way, don't give me the old line that it lacks communications. That problem has been solved for years by merging the Pick RDBMS with Unix.

Curtis S. Asbury
Director of MIS
Holborn Agency Corp.
New York

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

Investments in people earn commitment dividends

WILLIAM D. HARRISON

One of the most powerful and elusive qualities of human nature from a management perspective is commitment.

Consider the state of mind of a person as he pursues a personal objective. There is little question in his mind about whether he will achieve the goal — only how much time and energy must be expended to do it.

Similarly, when people are emotionally committed to management's goals, success is virtually assured.

In the computer systems profession, the moment of truth regarding commitment frequently comes in the early hours of the morning — in the unnerving silence of the computer room — while attempting to resolve a sudden, difficult problem.

True-life adventure

I keep remembering one such test of commitment that occurred in the mid-1960s in the Computer Systems Division of RCA Corp. The MIS department there had just finished a major conversion of applications software from the RCA 3301 to the newer RCA Spectra 70/45 processor.

The new hardware consisted of a processor with 10 7M-byte disk drives and 10 high-speed tape drives. The system was primitive by today's standards, but for the mid-'60s, it was considered fairly sophisticated.

All of the typical conversion problems had been experienced, and the output from the bill of materials procurement system was five days overdue.

The senior systems analyst, Murry, and the lead systems programmer, Hans, had volunteered to work late that night to help solve any problems that might occur.

By 2 a.m., they were mesmerized by the flashing lights on the console of the 70/45 as it completed the last processing of the bill of materials procurement. A manufacturing facility depends on this system to determine which parts must be purchased for the next manufacturing cycle.

There were five hours left to produce the output before the vice-president of manufacturing arrived at the computer room to evaluate the progress being made with the procurement software. He rarely had a problem finding words to express his unhappiness when anything delayed manufacturing.

The system had been running for almost six hours. With only minutes remaining before it finished, Murry and Hans heard the unpleasant sound of the operator's console typing out a warning message.

Before looking at the explanation, Hans made a guess at what caused the problem. "The output tape drive has reached the end-of-tape marker," he said.

Indeed, the take-up reel on the output tape drive appeared full — with only a turn or two of tape remaining on the supply reel. Projections had indicated that a procurement run large enough to fill an output tape would not occur for another year.

Silence filled the computer room. An early version of the TDOS operating system was being used, and both Murry and Hans knew that it could not produce multiple tape-output files.

It appeared to be a difficult situation. A dead end had been reached with TDOS, and the 3301 processor was already dismantled and packed away for shipment.

When Murry was faced with a tough problem, he always turned his chair around backwards, sat down and stared off into space. Hans customarily leaned his chair back against the wall, lit a cigarette and started to blow smoke rings.

They both knew they would not be held accountable for problems with the operating system, but they were not looking for consolation.

Quick thinking

After a few minutes of silence and about the 10th smoke ring, Hans said, "You know, the last time that I looked at a full reel, the tape did not fill it to the limit of the outer edge."

Murry knew immediately what Hans was thinking. He jumped out of his chair and ran to the tape library. He returned with a new reel of tape and said, "You're right. There's enough room for at least another 50 feet of tape."

Murry quickly removed the tape drive supply reel and with care and precision spliced an additional 50 feet of tape in front of the end-of-tape marker.

While Murry was splicing, Hans scanned the program listings for the operating system and worked out a patch to force a restart.

Hans had previously tested the read-after-write logic on the tape drives and knew that it worked as well as anything in

Continued on page 22

Harrison is an engineering manager at Siemens Information Systems, Inc. in Boca Raton, Fla.

Carried away by the job hunt

There are lessons in the blunders made by this overeager position seeker

RICK BLUM

Working in MIS has changed dramatically during the last half-dozen years. For instance, unsolicited calls from headhunters are way down. In the "good ol' days" of the early '80s, any programmer worth his weight in DO loops could expect to get one or two calls every week from a total stranger offering the perfect job at twice his current salary. All that was required was to scratch out a quick resume or a list of recent jobs, deign to meet with the prospective employer over lunch and you were in.

Not anymore. With hiring freezes, consolidations and — gasp! — layoffs being the order of the day, it is now the employee who has to do the legwork. Even headhunters won't take your name unless your expertise is in high demand. "Do you have any experience in artificial intelligence?" one headhunter inquired. "Sure, most of what I say I make up," turned out not to be the correct response.

But there are those headhunters who are helpful even when your resume does not cause dollar signs to flash before their eyes. One such helpful soul sent me an article entitled "The Top 10 Job Hunting Errors."

The list came as no suprise:

1. Poor resume.
2. Failure to network.
3. Limiting job sources.

BILL RUSSELL

4. Canned approach.
5. Part-time search.
6. Inadequate interview preparation.
7. Poor interviewing technique.
8. Restricted job search.
9. Negative attitude.
10. Poor physical appearance.

Unfortunately, in my zeal to avoid these little mistakes, I discovered that trying too hard can result in the dreaded crawl-under-the-desk-and-hide blunder instead. So as a public service and to balance the scales, I present my own "Top 10 Job Hunting Excesses:"

1. Concise resume. The first tenet of resume writing is to keep it short and simple. I did save considerable money, but shrinking my resume to fit on the back of a postcard didn't turn out to be a winning strategy.

2. Excessive networking. Be more selective than I was, when, fishing for leads, I called every business acquaintance in

Continued on page 22

Blum, a former product manager at a Boston-area computer company, now lives and writes in Carlisle, Mass.

Tidbits from the silly-resumes file

ROBERT HALF

A resume should be a well-written and concise summation of an individual's education, experience and knowledge. It should focus on contributions made to previous employers.

This advice may seem simple, but it is easier said than done judging from the thousands of strange, inappropriate and downright silly items in my "Resumania" files. Data processing job seekers are no exception.

"Was voted 'The Ugliest Man in Town' in a 1985 contest." A solid DP credential if I ever heard one.

"Languages spoken: English, French, Spanish, Cobol."

"Salary required: As much as I can get."

"Salary required: High six figures." I'd say $900,000 a year is a lot for a programmer in any geographical market.

Poor spelling on a resume ranks as one of the most common faults, especially for people in technical fields. Mistakes are particularly glaring when a job seeker boasts about the ability to communicate or about how accurate he is.

"Brought about incresed accuacy in my department." There's a credibility question here.

"Job objective: To utilize my skills and knowledge with an arganization that will allow me to develop my shills." "Arganized shills" sounds painful.

"I am a short-sleeved programmer pursuing a career in the management of a forward-looking company." Maybe he'll wear long sleeves when he reaches his goal.

"Hobbies: Love to trout fish with my wife." That poor woman, dangling from a hook and being tossed into a stream.

"Reason for leaving last job: Maturity leave." She needed nine months to grow up.

"Special certificates: Driver's license."

"Geographical preferences: I will relocate anywhere except Russia, Red China, Vietnam or New York City."

"Geographical preferences: Anyplace in the English-speaking world and/or Washington, D.C." We might not always understand what our elected officials are saying, but the basic language spoken in our nation's capital is English, I think.

I don't advocate stating on resumes reasons for leaving previous jobs, but lots of people do.

"Reason for leaving: The kidnapping." What kidnapping?

"Reason for leaving: Boss murdered his wife."

"Reason for leaving: The company made me a scapegoat, just like my four previous employers did."

"Reason for leaving: Salary terminated." Who could blame her?

One DP fellow wrote in his cover letter to one of my offices, *"A residue is attached."* Maybe I should start calling my collection "Residuemania."

Be careful when you write your resume, or the laugh could be on you.

Half is founder of Robert Half International, Inc., a personnel recruiter specializing in data processing.

Blum

CONTINUED FROM PAGE 21

my Rolodex file, including my insurance broker. He proceeded to sell me a $500,000 life insurance policy, since I wouldn't be covered at work anymore.

3. Too many job sources. Save some money — don't send your resume to every employment agency listed in the Yellow Pages of the Boston, New York and Los Angeles phone books. I received only two responses: one that wanted to know if I had ever considered a high-paying career as a masseur and the other a low-paying career selling ads in the Yellow Pages.

4. Individualistic approach. To separate myself from all the other techies out there and catch a prospective boss' eye, I wrote my resume in iambic pentameter, expressing the "essence of me" and how my achievement of universal wholeness could translate into more productive programs. The only thing I caught was the uneasy feeling that Miss Menard, my ninth-grade English teacher, would get hold of a copy and return it to me covered with red marks.

5. Full-time search. It pays to treat your job hunt as if it were your job. However, it is unwise to print business cards that read "THIS SPACE INTENTIONALLY LEFT BLANK" where your title would normally go.

6. Too much interview preparation. To present myself as knowledgeable about the organization and its networking communications product lines, I spent 26 straight hours memorizing IEEE numbers and their specifications as well as ISO, MAP and TCP/IP jargon. I fell asleep in the firm's lobby while waiting for the secretary to escort me to the interview.

7. Slick interview technique. To create the best possible impression during an interview, I first enrolled in a Dale Carnegie course and transformed my rather scratchy tenor into a mellifluous baritone. Incredibly, the first organization that interviewed me after said transformation offered me a job . . . as a receptionist.

8. Expansive job search. Rather than setting criteria on company size and location, I determined to consider any opening, regardless of the commute. But some interviews just aren't worth the effort — the one at Pipeline Systems Corp., Prudhoe Bay, Alaska, for instance.

9. Positive attitude. The typical answer to the question, "Why do you want to leave your current job?" might be, "My boss always takes credit for my ideas." But this comment is construed as a "negative attitude" by a prospective boss, since he intends to do the same thing. Determined not to fall into that trap, I suppose I adopted a tad too positive approach with the reply, "I would like to give new people the opportunity to steal my ideas."

10. Dapper appearance. Possibly the most neglected aspect of the entire job search is physical appearance. Even if you always wear the programmer's uniform of jeans and ripped T-shirt to work, when interviewing, you should attempt to visually create that all-important first impression of competence; to state forcefully, without having to utter so much as a single word, that you can effortlessly code complex algorithms. Lamentably, my tux did not seem to obtain the desired result.

And that is the list of blunders I've committed in search of the perfect job. So please, learn from my excesses and temper your job-hunting enthusiasm with a dollop of common sense. Oh, I finally did land the right job — when I ran out of blunders to commit.

Harrison

CONTINUED FROM PAGE 21

the industry. He was relying heavily on the read-after-write logic to handle the error that would result because of the splice in the tape.

Hans typed the characters on the console to restart. The tape drive wrote about three blocks before it encountered and erased over the splice.

The procurement software continued to run and finished in less than a minute. Before leaving to go home, Hans started the off-line print routine to print the output listings, and Murry left a short written report for the MIS director. "That was a full day's work," he mumbled.

Never say die

Murry and Hans had every right to call it quits when the operator's console typed the end-of-tape message. They knew TDOS could not handle the problem.

But calling it quits was not acceptable to either of them because their job was not finished, and they were committed to completing it.

Murry and Hans were not the type of people who give commitment easily. Their attitude was earned by management that understood the importance of people in getting the job done — particularly when doing so required extra effort and creativity.

Management that demonstrated a sense of fairness in pay policies, promotions and working conditions.

Management that delegated responsibility and gave workers an opportunity to use their creative skills.

Management that was committed to helping people work through their problems.

Management that consistently demonstrated its own commitment to people.

A little bit of commitment went a long way that night.

WE'VE JUST ELIMINATED THE ONE MAN WHO'S STOOD BETWEEN YOU AND THE WORLD'S MOST POWERFUL EIS.

Introducing the EIS/Generation Series from Pilot: Full EIS capability without the big support bills.

Announcing EIS/G, the industry's first series of EIS code generators. This new technology can reduce your EIS development and support costs by up to 80%. And you won't need a programming staff to implement powerful EIS systems. Pilot's experience with leading corporations will also ensure that your executives will have proven and effective EIS functionality. Code generation means you can have it at a fraction of the overall cost.

Put EIS/G to the test. Call us at (617) 350-7035 to arrange a one hour demonstration at your office. We'll show you EIS in a different shade of green.

PILOT
EXECUTIVE SOFTWARE
40 Broad Street Boston, MA 02109

The Best Database Now Comes With A Couple Of Extras.

CA-DATACOM/DB™ is now supported by the technological and financial strengths of Computer Associates.

With its unique combination of comprehensive RDBMS facilities and unsurpassed performance, DATACOM/DB has always been a superior database.

Now, backed by our commitment to protect your database investment, CA-DATACOM/DB stands ready for the future by giving you SQL support without costly hardware or software upgrades.

Additionally, CA-DATACOM/DB provides an active data dictionary to define, control and protect your data. Automated migration software lets you convert to CA-DATACOM/DB from VSAM, IMS or TOTAL* without costly rewrites. You can distribute data across multiple computer sites. And you can get it with CA-IDEAL, a complete 4th generation application development environment.

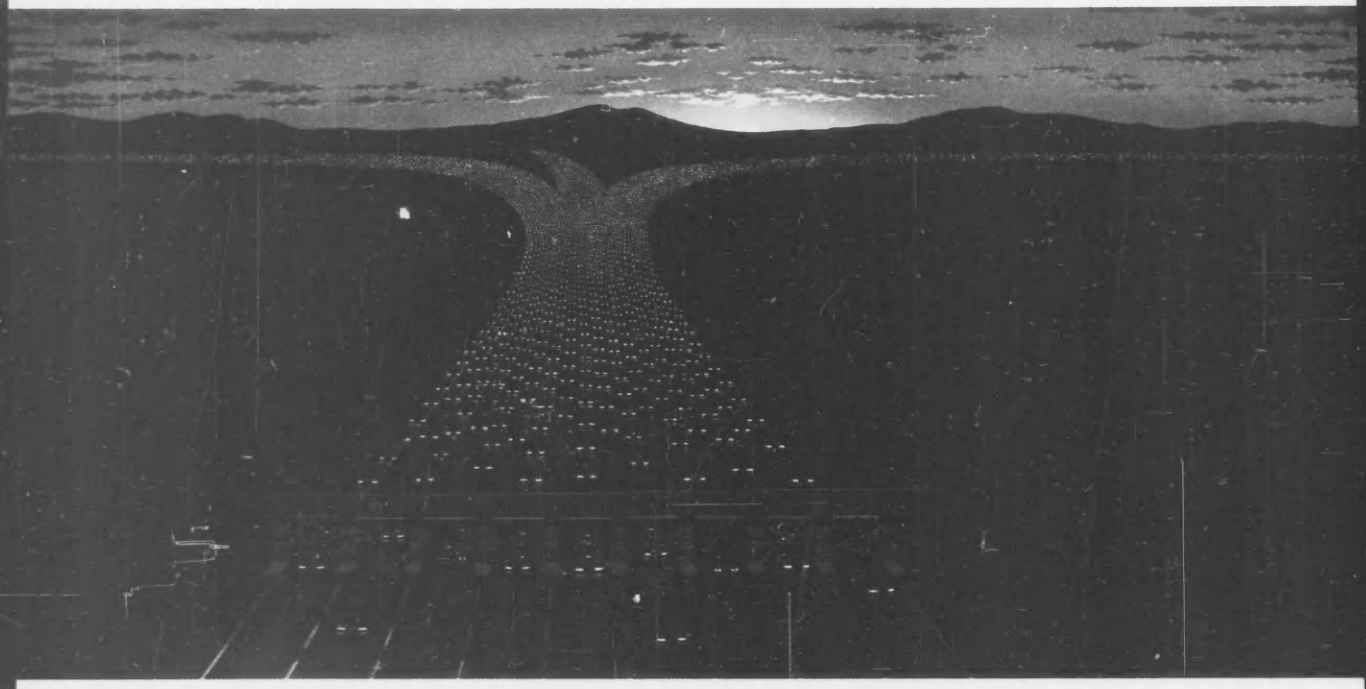
For more information, call Jamie Brooks at 1-800-237-9273.

COMPUTER ASSOCIATES
Software supervent ity design

*TOTAL is a product of Cincom Systems, Inc.

© 1987 Computer Associates International, Inc., Route 206 & Orchard Road, CN-8, Princeton, NJ 08543-0008

If you used INGRES on your backlogs, you'd be home by now.



INGRES Tools provide the fastest path through your applications jams.

It's a fact of every MIS manager's life. Backlogs will happen. But the problem isn't the volume of applications traffic. It's how your development tools handle the load.

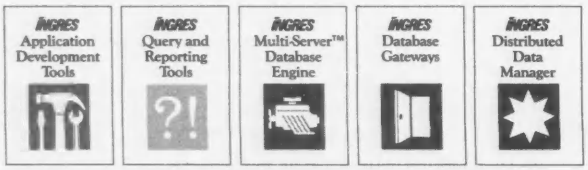
The solution is INGRES. INGRES Tools are part of a fully integrated environment that ties together SQL, 4GL, host languages, visual forms, and report editors in a way that dramatically accelerates the entire development process.

Shift into high gear. With INGRES, there's no slowing to switch tools. No need to fabricate tricky solutions. No road blocks. And once your applications are finished, they're ready to go places. Because your INGRES applications are easily portable across multiple hardware platforms.

What's more, INGRES open architecture allows you to integrate data from other data bases and systems in your applications—easily and transparently. All of which makes INGRES Tools the surest way to maneuver through applications development gridlock.

The tools of choice. Don't take just our word, ask DEC. They've chosen to distribute INGRES Tools to their users. You'll also find INGRES among the solutions preferred by IBM, Sun, Apple, and a long list of industry leaders. Our clients include two of the Big Three auto manufacturers, major financial institutions, oil companies, and service organizations worldwide.

Take the fast lane. Don't let backlogs bring your company to a standstill. Choose INGRES, and take the fast way home. For more information or to attend a free INGRES seminar in your area, call 1-800-4-INGRES.



INGRES
RELATIONAL TECHNOLOGY
Call 1-800-4-INGRES

Corporate Headquarters: 1080 Marina Village Parkway, Alameda, CA 94501, (415) 769-1400
International Headquarters: 99 Kings Road, London SW3 4PA, UK, 44-(1) 351.7733

INGRES, INGRES TOOLS, INGRES OPEN ARCHITECTURE and RELATIONAL TECHNOLOGY are registered trademarks of Relational Technology, Inc. DEC, IBM, Sun and Apple are registered trademarks of respectively Digital Equipment Corporation, International Business Machines, Sun Microsystems, Inc., Apple Computers, Inc. ©1989 Relational Technology, Inc. Printed in USA.

CW

YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39* per year — a savings of 62% off the single copy price. In addition, I'll receive special bonus sections of COMPUTERWORLD Focus on Integration.

First Name MI Last Name

Title Company

Address

City State Zip

Address Shown: ☐ Home ☐ Business Basic Rate: $48 per year

* U.S. Only. Canada $110, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government — State/Federal/Local
65. Communications Systems/Public Utilities/ Transportation
70. Mining/Construction/Petroleum/Refining/Agric
80. Manufacturer of Computers, Comp. Related Systems or Peripherals
85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
90. Computer/Peripheral Dealer/Distributor/Retailer
75. User: Other _____
95. Vendor: Other _____
(Please specify)

2. **TITLE/FUNCTION** (Circle one)
IS/MIS/DP MANAGEMENT
19. Vice President, Asst. VP
21. Dir., Mgr., Supvr., IS/MIS/DP Services
22. Dir., Mgr., Supvr., of Operations, Planning, Adm. Services
23. Dir., Mgr., Supvr., Analyst, of Systems
31. Dir., Mgr., Supvr., of Programming
32. Programmer, Methods Analyst
35. Dir., Mgr., Supvr., OA/WP
38. Data Comm. Network/Systems Mgt

OTHER COMPANY MANAGEMENT
11. President, Owner/Partner, General Mgr
12. Vice President/Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt
51. Sales/Mktg. Mgt.

OTHER PROFESSIONALS
69. Consulting Mgt.
78. Medical, Legal, Accounting Mgt.
80. Educators, Journalists, Librarians, Students
90. Others _____
(Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant
A. Mainframes/Supermms
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Office Automation Systems
F. No Computer Involvement

E4912-6

YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39* per year — a savings of 62% off the single copy price. In addition, I'll receive special bonus sections of COMPUTERWORLD Focus on Integration.

First Name MI Last Name

Title Company

Address

City State Zip

Address Shown: ☐ Home ☐ Business Basic Rate: $48 per year

* U.S. Only. Canada $110, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government — State/Federal/Local
65. Communications Systems/Public Utilities/ Transportation
70. Mining/Construction/Petroleum/Refining/Agric
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
90. Computer/Peripheral Dealer/Distributor/Retailer
75. User: Other _____
95. Vendor: Other _____
(Please specify)

2. **TITLE/FUNCTION** (Circle one)
IS/MIS/DP MANAGEMENT
19. Vice President, Asst. VP
21. Dir., Mgr., Supvr., IS/MIS/DP Services
22. Dir., Mgr., Supvr., of Operations, Planning, Adm. Services
23. Dir., Mgr., Supvr., Analyst, of Systems
31. Dir., Mgr., Supvr., of Programming
32. Programmer, Methods Analyst
35. Dir., Mgr., Supvr., OA/WP
38. Data Comm. Network/Systems Mgt

OTHER COMPANY MANAGEMENT
11. President, Owner/Partner, General Mgr
12. Vice President/Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt
51. Sales/Mktg. Mgt.

OTHER PROFESSIONALS
69. Consulting Mgt.
78. Medical, Legal, Accounting Mgt.
80. Educators, Journalists, Librarians, Students
90. Others _____
(Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant
A. Mainframes/Supermms
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Office Automation Systems
F. No Computer Involvement

E4912-6

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

SOFT TALK

Stanley Gibson

IBM as the gentle giant

IBM's driving of its repository as a standard for computer-aided software engineering (CASE) may well be an example of a kinder, gentler giant working for the common good.

In working with independent software vendors and users to create its repository, IBM is doing something that many have been clamoring for it to do. If the effort succeeds, it should boost the CASE industry and, correspondingly, the productivity in applications development at major IBM accounts.

Users asked for cross-system consistency, and they called for a new, complete dictionary. In Systems Application Architecture (SAA) and the planned repository, they are getting both.

However, the repository raises a couple of intriguing questions: 1) Will it be too late in getting to the users and 2) Is DB2 clonable?

Let's look at the first question. Although IBM says the repository will be announced this year, it probably won't ship this year. One independent software vendor that is working

Continued on page 30

Text retrieval finds its home

But relational DBMSs have trouble when it comes to free-form data

ANALYSIS

BY AMY CORTESE
CW STAFF

As Towers Perin, a management consulting firm based in New York, grew from 20 offices in 1985 to 55 worldwide today, it became harder for the various offices to keep in touch with what the others were doing. A system was needed to make proposals and reports available to consultants, whether in New York or London.

Similarly, Allied-Bendix Aerospace in Teterboro, N.J., wanted a system to track its engineering parts inventory for the firm's 560 engineers so that design efforts could be built on rather than duplicated.

What these two firms have in common is a need to manage nonstructured data — something their traditional database management system could not handle.

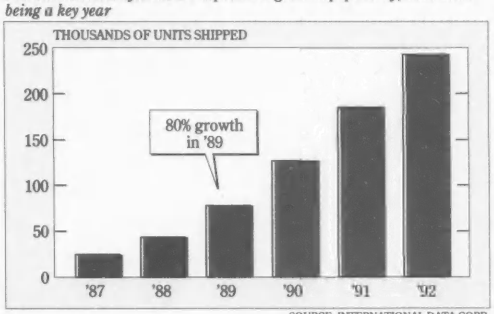
The solution for both — text management systems.

Allied-Bendix decided on Info DB from Henco Software, Inc. in Waltham, Mass., on a Digital Equipment Corp. Vaxcluster to manage its engineering documents. Sheldon Frick, database administrator at Allied-Bendix, says Info DB imports data from the Microsystems Engineering Corp. Mass-11 word processing software used by the firm and incorporates engineering diagrams with text.

Towers Perin went with Inquire by Infodata Systems, Inc. in Cambridge, Mass., which runs on the company's IBM mainframe and is integrated with the IBM office automation software.

Pivotal year

Full-text retrieval systems are expected to grow in popularity, with 1989 being a key year



SOURCE: INTERNATIONAL DATA CORP.
CW CHART: JOHN YORK

Consultants at the various offices access the system from their personal computers.

Both companies recall a limited number of products being available only a few years ago when they were evaluating options. Today, an increasing array of text products are offered by DBMS, word processing and office automation vendors as well as traditional text retrieval providers.

Getting around

Typically, a DBMS works with data that is structured — kept in well-defined data formats in which different records in a file have the same definition, such as name, address or department number.

Unstructured, or free-form, data, on the other hand, can take many forms and is typically lengthy.

A text management system has the ability to search and retrieve any word or string of words in a textual database. Most of these systems work by automatically creating an index of words showing where they occur in a database. The user does not need to know any reference points, such as a document name or other keyword, to conduct the search.

SQL, now accepted as the standard language for relational DBMSs, makes no provision for text handling. A trade-off was often made in choosing between the compatibility benefits that go along with SQL and being able

Continued on page 35

IBM hopes stay alive for 9370s

BY ROSEMARY HAMILTON
CW STAFF

It has been six months since IBM made its second major push to promote the 9370, and the troubled minicomputer line seems more than ever to be destined for mediocrity.

While IBM maintains that it has just recently made headway with the low-end 370 line in selected niche markets, it now also concedes that it made its share of mistakes with what was supposed to be a strategic midrange system.

In an interview recently, Martin Clague, assistant general manager of marketing in IBM's Enterprise Systems Division, acknowledged that the tale of the 9370 is a story of unrealistic expectations and misjudged market opportunities. But Clague also insisted that there is a better story ahead, now that the 9370 has finally found its markets.

"If you asked IBM executives

Continued on page 30

Inside

- Steinway tunes up for the '90s. Page 29.
- Not much excitement over RDB enhancement of VMS. Page 29.
- Sybase battens down SQL Server hatches. Page 29.

the totally automated office

The Next Generation in Office Automation

● *Fully Customizable* ● *Decentralized Administration* ● *Full Connectivity* ● *Integrated PC Support* ● *Resource-efficient*

Emc²/TAO IS A QUANTUM LEAP FORWARD IN ELECTRONIC MAIL AND OFFICE AUTOMATION.

Emc²/TAO is a dynamic system that gives Electronic Mail and Office Automation to everyone — from novice to expert. It can be tuned on an individual basis to suit the user's abilities and needs. Novices can start on day one with no training. Experts have everything they need. And, it has been designed as a platform to support an emerging set of capabilities as the evolution of office automation continues.

POWER THROUGH SIMPLICITY

Emc²/TAO provides hundreds of easy-to-use features for managing, organizing and distributing Electronic Mail and documents. Emc²/TAO includes electronic-mail, calendaring, document storage and retrieval, and a multitude of powerful bridges and gateways.

Emc²/TAO gives full control through decentralized administration. Authorization can be delegated by **feature**, by **department** or by logical **class**. And Emc²/TAO's user interface allows product features to be custom-tailored to suit the needs of each individual user or group of users, at the installation's discretion.

Emc²/TAO is simple, powerful, and allows unprecedented connectivity.

ALL ENVIRONMENTS

- MVS, MVS/XA
- VM/CMS
- VSE, SSX
- TSO, CICS, IMS, IDMS
- PCs (Personal Emc²)
- VAP (Special Emc² VTAM Application)
- FIVS (Fischer International Virtual System)

GATEWAYS

- PCs and LANs.
- SNADS.
- X.400.
- BITNET.
- DIA/LU 6.2 compatible devices and systems.
- Western Union services: (Telex, Facsimile, EasyLink, etc.)
- DISOSS.
- PROFS.
- DEC (VAX Mail, All-in-One).
- WANG (Wang Office).

And more.

FISCHER INTERNATIONAL SYSTEMS CORPORATION

Emc² TAO

ELECTRONIC MAIL COMMUNICATION CENTER / TOTALLY AUTOMATED OFFICE

Emc²/TAO is the smart answer.
Many of the largest corporations in the world have already selected Emc².

CALL NOW for more information. Toll-free: 800 237-4510. In Florida: 813-643-1500.

Dan Goulet,
Ph.D., Director,
Academic Computing Services,
University of Wisconsin-Stevens Point.

Jim Leonhart,
AT&T National Account Manager

These men started a revolution on campus.

Recently, an information management revolution occurred at the University of Wisconsin–Stevens Point. Dan Goulet from the University and Jim Leonhart of AT&T—campus radicals of a different kind—explain how they were able to realize a bold and complex vision.

FEBRUARY 22, 1989

Jim: I remember the first day we met. You had been around the block a few times, but weren't getting the answers you needed.

Dan: We wanted to create a unique education environment: a free-flowing on-line computer campus. We had a vision, and we were looking for someone to help build it.

Jim: A distributed networked computing solution, that's what we'd call it now: a way to process, move and manage information effectively, throughout a widespread organization.

Dan: We talked to many computer vendors before you. We got tired of describing what we needed, so we drew it. That graphic was about 13 feet long.

Jim: More like twenty. The chart showed every information resource on campus linked together, accessible to students, faculty, and administration. It became the wallpaper in my office for fifteen months.

Dan: It was like a blueprint for a data superhighway.

Jim: We put our ISN wide-area network at the center—like an interchange—and built fiber and twisted-pair data lanes to applications running on AT&T 3B2s, DEC, UNISYS and other hosts located in all the departments. We put on- and off-ramps in strategic locations: StarLAN networks that gave access to the highway from workstations.

Dan: We designed everything from the user perspective. The more technically remarkable the system became, the harder we worked to make it approachable.

Jim: Easy for novices, powerful enough for programming students.

Dan: We developed a menu-driven user interface that is consistent and clear. Students and faculty can select applications like checking spelling, transmitting course grades, even browsing through the on-line card catalog of 1.5 million books at the University of Wisconsin–Madison. We wanted desktop power and access, but we wanted to process information where it made the most sense.

Jim: Thinking back, we realized early that the complexity of your vision precluded a single-system focus. You needed open systems.

Dan: You were really the only ones that understood this point. Open systems allow us to use off-the-shelf components; vendors have to bid against each other to get our business. Open systems are the secret.

Jim: It's mind-boggling how much computer power is out there. We wanted to harness it all, yet give a piece to every individual.

Dan: A truly distributed network, one we don't think we'll ever outgrow. We've added 300 WGS workstations in the last five months.

Jim: Dan, where in the world is that wallpaper today?

Dan: We had it bronzed. Today, so many colleges and businesses really need a similar solution. That's probably why we've had so many visits from them lately.

Jim: Little did we know back then, when we first met.

Dan: Oh, something tells me you had a hint.

The Stevens Point Solution:

THE CHALLENGE:

Create a distributed computing revolution; link the campus into an integrated information resource open to every user.

THE SOLUTION:

AT&T 3B2 computers support a multitude of UNIX® System V-based applications. AT&T StarLAN connects AT&T WGS computers, a variety of micros, and hosts together. The AT&T Information Systems Network (ISN) is every campus user's gateway to all computer resources.

THE RESULT:

Stevens Point has been designated a Center of Excellence for Distributed Academic Computing by the Board of Regents for the entire University of Wisconsin system. The majority of the 9000 students on campus regularly use the network for coursework and homework. Faculty have integrated computing into 41% of their coursework.

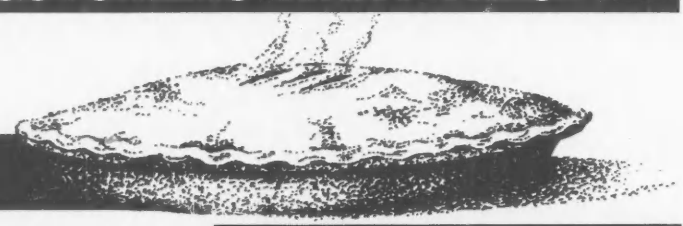
Call your AT&T Account Executive, an AT&T Authorized Reseller, or 1 800 247-1212, Ext. 156.

DEC is a registered trademark of Digital Equipment Corp. UNIX is a registered trademark of AT&T in the U.S. and other countries. ©1989 AT&T

your computing systems and networking solutions company

AT&T
The right choice.

DO YOUR CUSTOMERS WANT THESE?



OR THIS?

Your customers need **integrated** solutions to their problems. They buy the whole pie—not separate ingredients. This means you need to work with hardware, software, networking, information and marketing to answer your customers' challenges.

"Creating the Information Infrastructure," a conference sponsored by the Information Industry Association, is about how successful companies of tomorrow will provide the integrated solution—the whole pie—to their customer's information management needs. IIA, the world's largest trade association of information companies, recognizes that the information industry is an amalgamation of evolving industry segments forming a worldwide support structure—allowing for the creation, processing, packaging and delivery of information to end-users around the world.

For the first time, all information industry players will unite to facilitate intra-industry working relationships essential to new product development, marketing and meeting customer needs.

Come to participate, to share, to explore the whole world of information.

KEYNOTE ADDRESS

Robert E. Allen, *Chairman & CEO*, AT&T who will discuss "Compatibility and Common Sense: Building Blocks for the Global Information Age."

Headliners include speakers from each segment of the information industry.

Kenneth Koppel, *President*, Ziff Communications Company, will show how information providers can leverage the information infrastructure to gain competitive advantage.

Mitch Kapor, *President*, ON Technology, Inc., one of the innovators of Lotus 1-2-3, will share his insights on the changing role of software within the information infrastructure.

Philip Quigley, *President*, Pacific Bell Corporation, will focus on networks and their role in the delivery of information.

Michael J. Quinlan, *IBM Vice President & Asst. General Manager, Personal Systems*, IBM Corporation, will present successful techniques for marketing managers.

Regis McKenna, *President*, Regis McKenna, Inc. will discuss how the information infrastructure is driven and unified by marketing strategies.

A RECIPE FOR INTERACTIVE DISCOVERY

Challenge concepts, question experts and clarify business plans—through a series of 20 roundtables designed around each ingredient of the infrastructure:

TRACKS OF FOUR ROUNDTABLES

- **Hardware**—Discover Trends in Computer Systems.
- **Software**—Address Ease-of-Usage Issues.
- **Content**—Emphasize the Concept of Value.
- **Marketing**—Explore the Marketing Mix.
- **Networks**—Examine Ease-of-Access Issues.

This conference is unlike any you have ever attended.

Registration Rates

IIA Members: $450 (to 3/31)
$495 (to 4/30)

Non members: $750 (to 3/31)
$775 (to 4/30)

SPECIAL BONUS

Two conferences for the price of one.

IIA's Spring conference is being held concurrently with the computer software and services association, ADAPSO's Spring conference. Although IIA & ADAPSO are holding their own separate programs, registrants can freely attend all program sessions.

CREATING THE INFORMATION INFRASTRUCTURE
New options for IP's

May 14–17, 1989
San Diego Marriott
San Diego, CA

Information Industry Association
555 New Jersey Ave., N.W.
Washington, D.C. 20001
202-639-8262
800-346-6561

VMS users: Decwindows yes, RDB no

BY AMY CORTESE
CW STAFF

Digital Equipment Corp. is baiting the latest version of its VMS operating system with a runtime license for RDB, but so far users are not biting.

More appealing to users is the Decwindows graphical interface, although recent interviews with DEC users indicate that it will be implemented slowly.

VMS 5.1 contains significant enhancements — despite DEC's tradition of reserving major releases for even-numbered iterations. Following last year's inclusion of symmetrical multiprocessing in VMS 5.0, 5.1 will feature the Decwindows graphical interface for use with DEC-supported workstations.

Further, a license for a runtime version of DEC's RDB is included at no extra cost. Customers will still need to order and pay for the cost of the actual media and documentation but will not have to pay for the RDB license, which typically costs tens of thousands of dollars.

Big attraction

A runtime version of RDB, while not capable of developing applications, will be attractive to many DEC customers, said Victoria Farrell, product marketing manager of DEC's Database Systems Group. With it, third-party software developers can write applications that use RDB without requiring customers to purchase a production version.

As the first copies of VMS 5.1 hit the streets, customers confirmed that they had received the license, but many nonetheless indicated they would not be making use of RDB.

One VMS user, Ron Carron

Continued on page 35

High-tech, tradition in concert at Steinway

ON SITE

BY RICHARD PASTORE
CW STAFF

NEW YORK — The handcrafted Steinway has been the world's piano standard for more than 100 years, according to pianists, music critics and industry experts. But reputation will not be enough to keep Steinway & Sons, founded here by German immigrant Henry Engelhard Steinway in 1853, fine-tuned in the 1990s.

A souring marketplace spurred Steinway's move toward computer technology, said Robert Birmingham, whose Waltham, Mass.-based Steinway Musical Properties, Inc. bought the company from CBS, Inc. in 1985.

"When the market starts to turn off a little, there's got to be a reason for it," Birmingham said. One such reason, he noted, was inconsistency in quality, a symptom of an antiquated manufacturing process.

Birmingham's remedy has been to "add a little more science to the art of piano making." His continuing goal for Steinway is to harmoniously mesh today's computer-aided manufacturing and research and development techniques with the old-world methods that literally built the company's reputation.

For this tricky task, he has tapped Daniel T. Koenig, a 21-year veteran of General Electric Co. and an author and lecturer on computer-integrated manufacturing (CIM).

Koenig, Steinway's director of manufacturing, initiated a 10-step CIM effort and, as the company's self-proclaimed "chief cheerleader," has overseen the development of computer-aided design (CAD) and R&D in acoustics while holding tight under the Hewlett-Packard Co. minicomputer umbrella.

After months of seminars and study of the factory's manufacturing flow and production needs, Steinway's "CIM council" of department managers is now interviewing vendors for an appropriate manufacturing resource planning (MRP) II package. The group expects to have it up and running by year's end.

"The MRP system will give us better control of material movement throughout the factory," Koenig said. This is a simple but vital goal for Steinway, which has to coordinate the location of approximately 12,000 different parts — from inch-long pieces of rosewood to 340-pound plates of cast iron — for each of 10 pianos it makes per day across a four-floor, 400,000 square-foot factory area.

ANDY FREEBERG

Steinway's Koenig *orchestrates CIM effort*

Steinway's current hardware setup consists of an HP 3000 Model 70 with 8M bytes of memory that hosts three dozen IBM-compatible personal computers. The systems run off-the-shelf financial applications and customized retailing programs.

Bill Graham, Steinway's director of MIS and a CIM council member, said the HP 3000 will likely be the heart of the CIM system. "We prefer not to switch boxes because of the cost of conversion, but we will be upgrading to HP's RISC technology," he said.

Steinway is also applying computer technology to its chief selling point — the piano's sound. Koenig's engineering staff has appropriated semi-retired virtuoso Vladimir Horowitz's Steinway concert grand — which many experts claim is the best-sounding piano ever made — and wired it up to an HP Dynamic Signal Analyzer Model 35660 A.

With electrode-like attachments to piano parts, the machine analyzes sound vibrations and generates printed plots. These are being compared with ones from more "ordinary" pianos in hopes of finding clues to inconsistency in sound quality. Discoveries like this are essential because, Koenig says, "We can't make improvements until we understand the actions."

Currently relegated to PCs, the 10 Steinway engineers will soon have a new midrange machine to do their vibration-analysis number-crunching, Koenig said. The software for these studies may come from an unusual source — the U.S. Navy. "They do some acoustical signature analysis and have some newly declassified stuff that may be of use to us," Koenig said.

Old meets new

Such high-tech methods for understanding what old-world artisans intrinsically produced is ironic. But the new blood at the company has high regard for the century-old Steinway traditions that echo in the corners of the dusty, airplane hangar-like expanse of the factory.

For example, the knowledge contained in 6,000 original piano design drawings — many dating back to the 19th century — are being painstakingly preserved with an HP Vectra 8088 CAD station. Draftsmen are copying these diagrams into the CAD system so that the originals, yellowed and brittle with age, can be displayed as historic artifacts.

Koenig is taking steps to preserve the living knowledge base as well. With the retirement of veteran craftsmen — some of whom are the last of two or three family generations to work at Steinway — the company risks losing lifetimes of accumulated expertise. To guard against this, Koenig is looking into use of expert systems to "debrief" these human resources.

With such computer-assisted programs implemented and on the way, Steinway has struck a corporate chord by proving that it is possible for a firm to modernize while still maintaining its soul of venerable tradition.

Sybase claims security clearance

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C.— Sybase, Inc. ushered in a new era in computer security by announcing earlier this month what is said to be the first relational database management system with access controls designed to meet government standards for multilevel security.

The product "represents a major milestone in the evolution of trusted computer systems," said Stephen T. Walker, a former Pentagon official known as the father of the National Computer Security Center (NCSC).

Sybase, located in Emeryville, Calif., claimed that the Secure SQL Server gives government agencies, defense contractors and financial institutions the ability to store data of multiple security classifications in a single database. Individual rows in data tables are given security labels, and users can gain access to only those rows that they are cleared to see, update or delete.

The Secure SQL Server is designed to meet the NCSC's B1 and B2 levels of security, which require discretionary and mandatory access controls. However, the product has not yet been evaluated or certified by the NCSC. In fact, Sybase faces some risk because the NCSC standard for secure DBMS applications, called the Trusted Database Interpretation, will not be completed for another six to 12 months.

Sybase officials, asserting that their product closely tracks the current draft of the standard, said that as the standard evolves, Sybase will comply with the changes.

Focus shifts

In the past, the focus of security products has been the operating system. "But the wave of the future is security in the DBMS . . . because that provides more portability and more control over the data resource," said Larry Willets, a software analyst at IDC Washington, Inc., in Vienna, Va.

Furthermore, having an off-the-shelf package will help users and contractors avoid the expensive hassle of building custom databases to meet security requirements, he said.

"As great as the Sybase announcement is, the big deal is that we are seeing the birth of the third phase of relational technology: true control over the data resource," Willets said. The first two phases were the implementation of the relational data model and ongoing efforts to boost performance, he said.

Although Sybase is the first to market, Willets noted that Oracle Corp., Relational Technology, Inc., Informix Software, Inc. and AT&T are all developing secure DBMS products for a highly competitive market.

Initially, the Secure SQL Server will be available on Digital Equipment Corp. VAX computers running Ultrix.

Beta-testing of the B1 version will begin by the end of this month, with commercial shipments expected in the second half of this year, Sybase said. The B2 version will be available sometime in 1990, the vendor added.

The price is $20,000 to $200,000, depending on the CPU size.

IBM 9370s

CONTINUED FROM PAGE 25

if [the 9370] met expectations, the answer is no," Clague said. "But were those expectations real? They were not."

San Jose, Calif.-based market research firm Dataquest, Inc. estimated this month that IBM had shipped 10,000 9370s worldwide in 1988. Between 30% and 40% were shipped in the U.S., Dataquest added. Clague refused to release shipment numbers, saying that "we in the 370 world aren't in the habit of doing that."

But last year, IBM had stated that less than 5,000 9370s shipped in 1987; analysts said they believed the actual 1987 shipment number to be between 2,500 to 3,000 systems.

Altogether, then, IBM has shipped about 13,000 9370s since its 1987 rollout, according to estimates. By contrast, about 30,000 Application System/400s shipped in the first four months of that product's life.

IBM's current position on its 9370 draws a painful contrast to its plans for the system two years ago. It was to have been IBM's big hit in the midrange arena, the VAX killer, the vehicle to bring IBM's 370 world out of the glasshouses and to the masses.

Last week, Clague identified six key areas in which IBM now sees the 9370 making its mark:

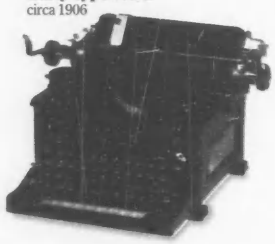
- The new system for users of outdated low-end 4300s.
- A platform for Pick Systems' Pick operating system.
- A platform for IBM DPPX users, who had been using discontinued 8100 systems.
- A platform for users of MUMPS.
- A communications gateway for users with multivendor environments.
- An applications-specific processor for select vertical markets.

This is not the mainstream runaway hit IBM had dreamed of, but Clague insists that IBM has learned from its 9370 mistakes. The biggest error in judgment, he said, was identifying the distributed processing market as the key to the 9370's success.

"The facts are it wasn't able to be all things to distributed processing," he said. "Our customers, as well as us, focused on big distributed opportunities and weren't successful because any distributed opportunity takes a while to do. We learned that with the 8100 and Series/1. We just forgot our history."

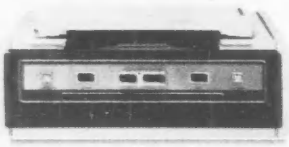
When asked if damage had been done from the less prepared way in which the 9370 was launched, Clague said, "In the short term it did a lot of damage. I wish we could do it over again. Future releases will certainly be put under [the AS/400] model. That market introduction strategy was pretty sound, and it enabled us to reshape our thinking."

Imagine what business would be like without these technological breakthroughs...



Early Typewriter
circa 1906

The Wright Flyer
Dec. 17, 1903



Office Photocopier
circa 1965

...Now imagine what your business would be like with PREFERENCE Computer-Based Reference!

A few technological breakthroughs have made a major impact on today's business world. Without the telephone, the typewriter, a facsimile machine, the photocopier and airmail, business would just not be the same.

Now, another new development known as **PREFERENCE**, computer based reference, is revolutionizing the way business people access information.

In order for your business to work, your people need the right information at the right time. So **PREFERENCE** was developed to put the needed information at their fingertips.

From payroll to sales records, and from product information to the personnel handbook, your company information can be stored within a mainframe computer for easy access by those who need it. This single software package, which operates in an IBM mainframe environment, permits simultaneous access from multiple applications.

PREFERENCE helps people create, review and distribute reference information while moving seamlessly back and forth between electronic documents and on-line applications. With the stroke of a single "help" key, needed reference material can be accessed without ever leaving an application.

Within **PREFERENCE**, information is presented consistently through an integrated package of text, data and graphics. Off-line documentation is also available in a wide variety of formats.

At Goal Systems, we believe **PREFERENCE** will have the kind of impact on your business that the telephone, the typewriter, the facsimile machine, the photocopier and airmail have had in the past.

Once **PREFERENCE** is in place, you will find that the ongoing task of accessing and updating corporate information has become relatively easy. And you will wonder what your business ever did without it. For more information or for a free demonstration diskette, call **1-800-848-4640.**

Goal Systems
Software Solutions

Goal Systems International Inc. • 7965 N. High Street • Columbus, Ohio 43235 • Phone 614-888-1775
Goal Systems International S.A.R.L. • 88 avenue de Wagram • 75017 Paris, France • Phone: (1)42 67 55 55 • Telex: 641.094

Gibson

CONTINUED FROM PAGE 25

closely with IBM on the repository guessed it wouldn't ship until a year from now. Even when it does ship, IBM says, it won't be in its final form.

Indeed, the downside is that both full-blown SAA and the repository will be taking place (to borrow a phrase that has become a perhaps overused staple in the IBM lexicon) "over time" — maybe over too much time.

What should people do in the meantime? Just waiting for it doesn't get applications written any faster. But does it make sense to implement another data dictionary, encyclopedia or repository substitute? This is the users' quandary.

Several of the small CASE vendors working with IBM on the repository are keeping their options open, just in case IBM's rollout schedule lags dangerously behind users' needs. They plan to continue to offer their own dictionaries, encyclopedias and repositories. Several plan to keep DEC's Common Data Dictionary (CDD) Plus on the front burner.

Many third parties are planning a repository strategy to unify multivendor accounts, something neither IBM nor rival DEC can promise. Generally, the largest accounts have both IBM and non-IBM equipment, a potentially large customer base for these vendors.

Users may always gravitate toward DEC. Indeed, if IBM can be seen as having a foe in all this, it would be DEC, whose CDD Plus is considered more advanced than what IBM now offers. With the VAX architecture and the VMS operating system, DEC has the single architecture that IBM is trying to create with SAA.

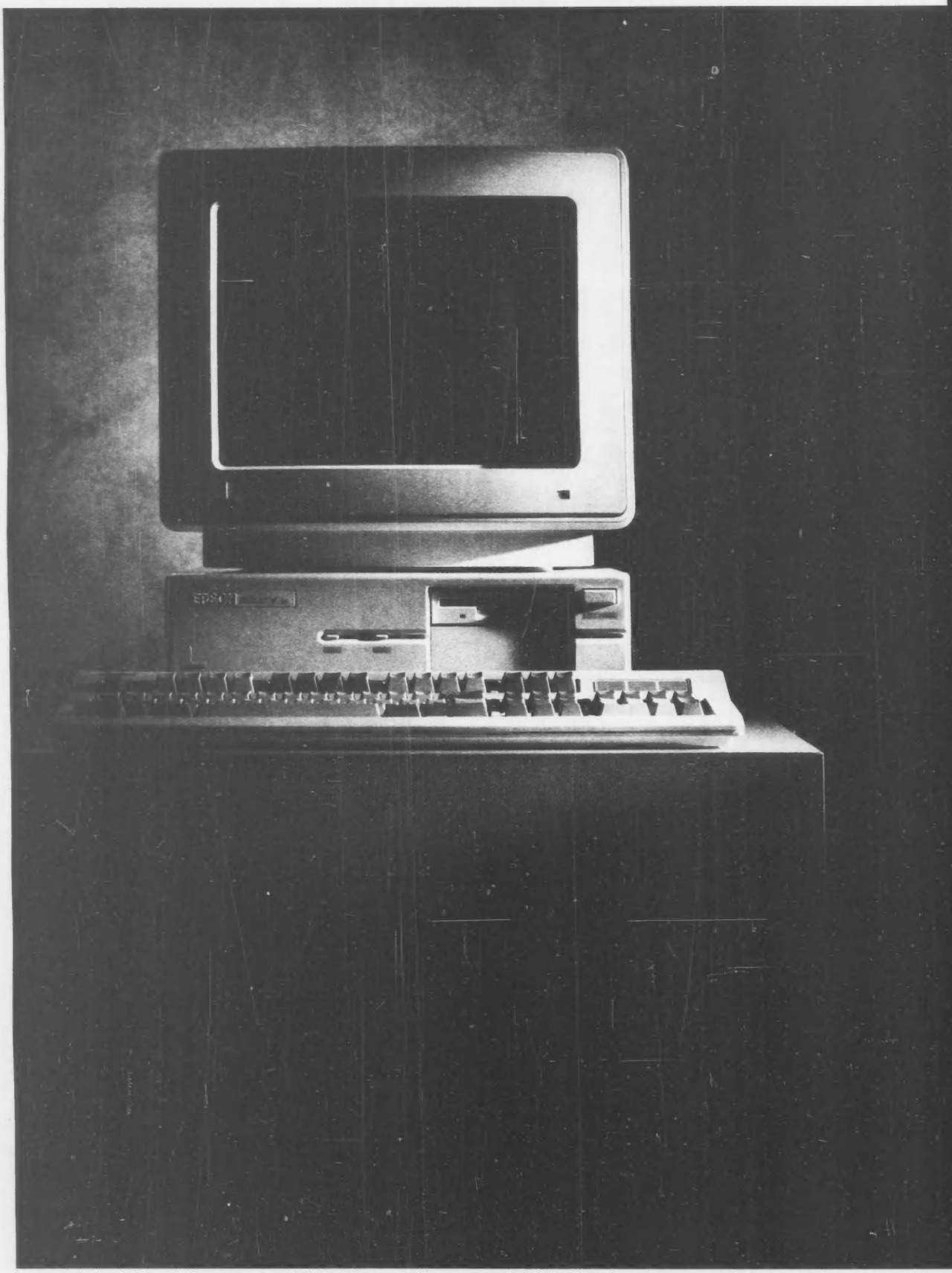
Now, let's move to the second question, that of DB2 being cloned. Why couldn't it be sidestepped for some other non-IBM relational database management system using SQL that can run on MVS and work with the repository, which IBM says will have an open architecture? This would be a virtual cloning of DB2. However, IBM has strongly suggested that a strictly IBM SQL database system will be required.

If DB2 could be eliminated as a requirement, then a user could conceivably have a plug-compatible mainframe, MVS, a non-IBM SQL database manager, non-IBM fourth-generation languages and CASE tools working with the open-architecture IBM repository. A near-total cloning would appear possible.

But, of course, this is what IBM would like to avoid — how, exactly, we'll have to see.

Gibson is *Computerworld's* senior editor, software.

All you need for superior Model 30 performance is one new piece of equipment.



Epson Equity Ie. 8/10MHz 80186 microprocessor, 640K RAM, 720K 3.5" FDD, serial, parallel and mouse ports, one year limited warranty. IBM is a registered trademark of International Business Machines Corp. Epson is a registered trademark of Seiko Epson Corporation. Equity is a trademark of Epson America, Inc., 2780 Lomita Blvd., Torrance, CA 90505. **(800) 922-8911.**

An Equity Ie.

In speed and versatility, the sleek Equity™ Ie goes faster and farther than other machines in its class.

At 10MHz, it runs 25 percent faster than the IBM® Model 30. With four industry standard expansion slots—one more than IBM—the Equity Ie gives you flexibility and room for growth.

Even better, the brand new Equity Ie comes with built-in MCGA video and a palette of 256,000 colors for sophisticated graphics. Of course, the Equity Ie offers the reliability, quality and value that millions of people have come to expect from Epson® computers and printers. The new Equity Ie. It's a Model 30 class computer that others will be modeling theirs after.

EPSON

WHEN YOU'VE GOT AN EPSON, YOU'VE GOT A LOT OF COMPANY.™

Terminals offer multivendor view

BY ROBERT MORAN
CW STAFF

HACKENSACK, N.J. — Corporations that must access information from both IBM and Digital Equipment Corp. systems may no longer need to keep an IBM 3270-type and DEC VT series terminal on the same desk.

Intelligent Information Systems, Inc., located here, recently introduced a series of intelligent terminals that hold simultaneous sessions between the 3270 and DEC environments.

The terminals, which connect directly to an IBM 3174 or IS-374R communications controller, offer split screens that allow users to work in both environments on the same terminal by using a hot key.

"For the interim, this is a very nice solution — the only available solution," said John Dunkle, vice-president at Workgroup Technologies in Hampton, N.H.

Users, however, must rekey information to move it from the IBM screen into the DEC screen or from the DEC side into the IBM portion. Within three years, IBM OS/2 workstation users will be able to dynamically cut and paste such information from one environment to the other, Dunkle said. He added that OS/2, which today supports nonconcurrent sessions, will be extended to 32 concurrent sessions.

The new terminals — the IS 391D/V, IS 3192D/V, IS 392C/V and IS 392F/V — range from $1,445 to $2,475 and are available now. In addition, users of the company's four older models can upgrade to the series with a single board that costs $450.

DB2 editor ups speed, support

BY ROBERT MORAN
CW STAFF

FORT LEE, N.J. — On-Line Software International, Inc. provided support for Version 2.1 of IBM's DB2 and a 10% access-speed improvement for DB2 tables with the latest release earlier this month of its Proedit interactive DB2 table editor.

With Version 3.2 of Proedit, which works under IBM's ISPF teleprocessing monitor, a programmer creating a database in DB2 Version 2.1 can copy a table description, and Proedit will automatically copy over existing referential integrity definitions.

The version saves users work, said Colin White, an independent consultant and editor of *InfoDB*, a database journal. "A Proedit user would find it annoying to carry across the definitions," he said. "Without referential integrity, a user creating a copy of a table would have to update the table manually."

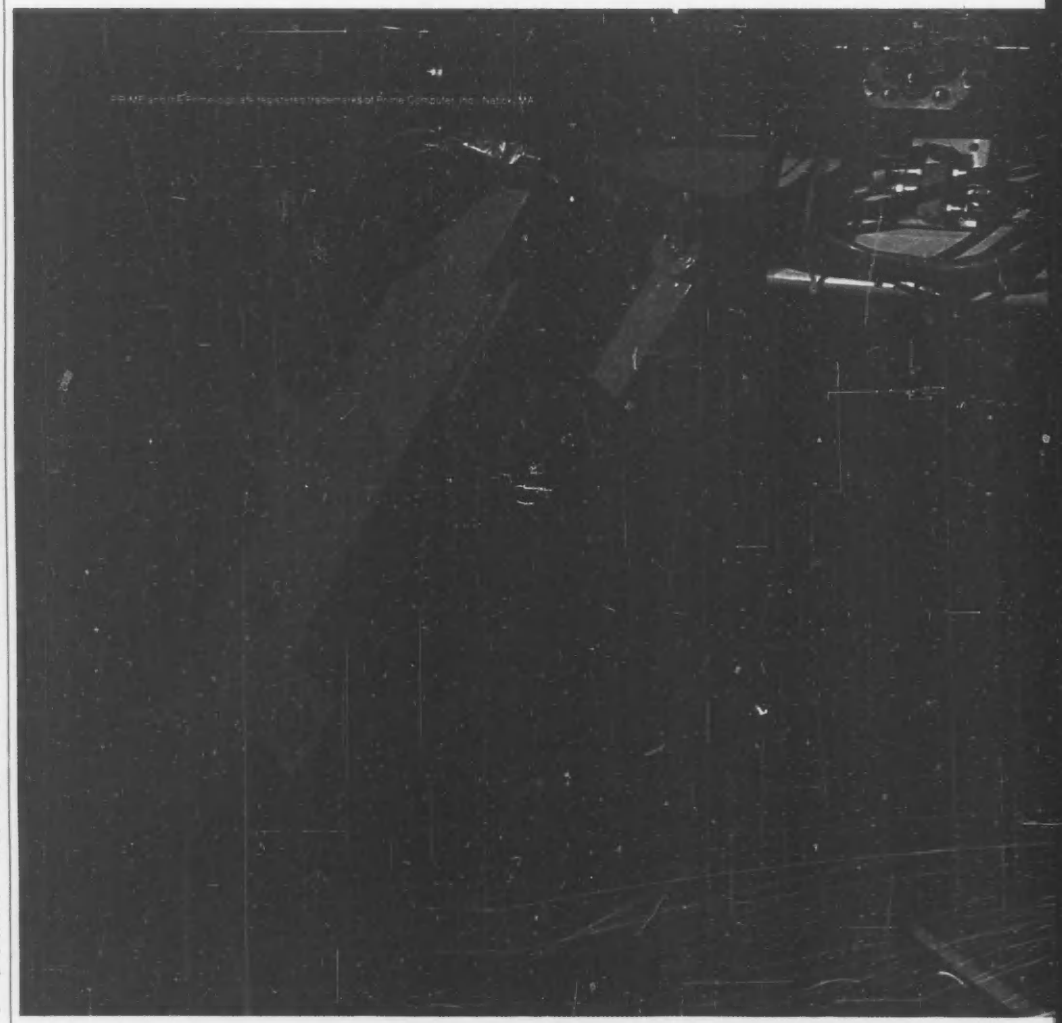
White added that Proedit's support for the latest version of DB2 and referential integrity leaves other vendors playing catch-up to modernize their products.

Despite the merits of Proedit, White said that On-Line will have trouble gaining acceptance with organizations that prefer "complete solutions" of DB2 tool sets from large vendors.

With the table editor, an applications programmer can access DB2 data without leaving ISPF. With IBM's DBedit, for example, a programmer would have to copy SQL code out of the program, exit ISPF, enter another IBM utility to test the code and then return to ISPF to make changes to the programs, said Joe Olynick, On-Line's vice-president of database product development.

One beta-test site user lauded the product because it allowed him "to get directly into DB2 tables."

On-Line said Proedit runs in more than 10% of U.S. DB2 sites and is available at a one-time license fee of $18,500 per CPU.


WE HELPED A BI
Ah, the miracles of the modern world. Consider Robotic Vision Systems Inc.
Using specialized laser technology, they've developed a way to scan 3-D objects with incredible precision. So robots can actually see where they're going.
And how do they turn
what their machines see into usable information?
With computer systems from Prime
We give Robotic Vision's laser technology the capacity to record information on a powerful CAD/CAM (Computer-Aided Design/Computer-Aided Manufacturing) database.
This information is used

DEC's VMS

FROM PAGE 29

at Technicon Corp. in Tarrytown, N.Y., said he will be putting VMS 5.1 up in the next few weeks but will not use RDB.

According to some analysts, DEC's long-term plans are to tie RDB more closely into the VMS operating system, similar to the Application System/400's integrated relational DBMS and operating system.

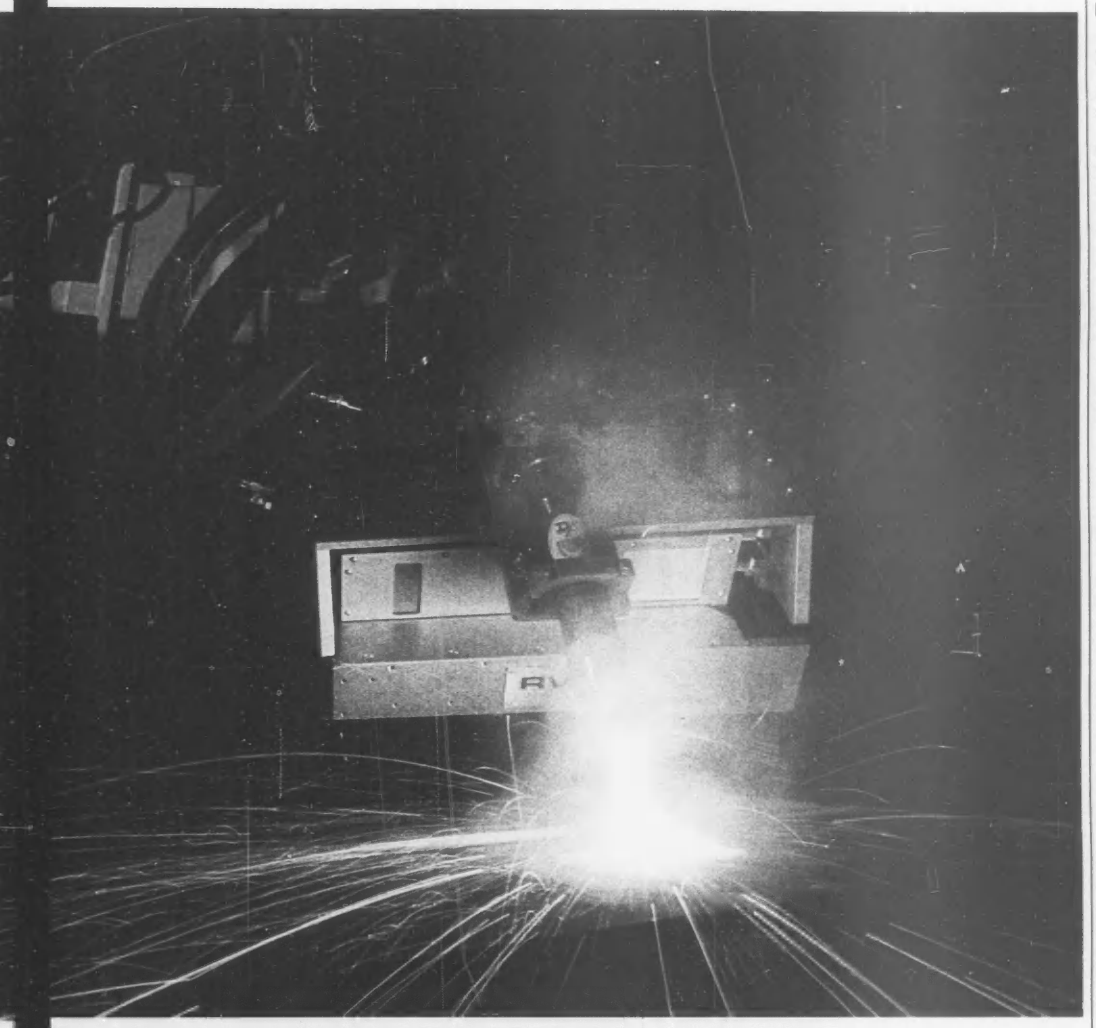
However, Farrell said it is unlikely that DEC will bundle a development version of RDB with future versions of VMS.

Although the packaging of an RDB license will not be significant in the short term, Robert Therrien, an analyst at Paine Webber, Inc. in New York, says it will be viewed as a strategic move over time.

Therrien likened DEC's situation to IBM's in 1985, when it announced an improved version of DB2, anointed it as a strategic product and made it available for nominal fees. As customers started using the product on a trial basis, DB2 rapidly gained acceptance, catching many third-party DBMS vendors off guard, Therrien recalled. He noted DEC agreements with third-party vendors such as Relational Technology, Inc., Culinet Software, Inc. and Ashton-Tate Corp. to support RDB.

Of more significance to many customers was Decwindows. While some indicated they would be running VMS with Decwindows within six months, several had not even moved to 5.0 yet and are still at VMS 4.7. The leap to Decwindows will be a two-step process, requiring customers to first move to 5.0 and then to 5.1. But according to users and analysts, this should not pose much of a problem.

According to Andrew Kenah at DEC's VMS product marketing group, any application running on VMS 5.0 will run on 5.1 without changes.



ND WELDER SEE.

develop detailed wireframe diagrams and 3-D
rface models. Images that can be modified and
nt to production in the blink of an eye.
Of course this is just one dream come true for
botic Vision Systems. Since 1983 this far-sighted
mpany has grown 500%. And their success is
rt of our success. Prime is a Fortune 500 com-
ny with annual revenues of over $1.5 billion.
If you'd like to know how Prime can help
improve your vision, call 1-800-343-2540
(In Canada, 1-800-268-4700).
Prime. Will miracles never cease?

Prime®
Prime Computer, Inc.
Prime and the Johnson & Johnson Family of Companies are proud co-sponsors of the PBS series NOVA.

Text retrieval

FROM PAGE 25

to manage text separately from other corporate data.

Today however, most relational vendors are making extensions to SQL or their proprietary languages to accommodate text.

Software AG of North America, Inc. introduced a text-handling system — Text Retrieval System — this past fall, and Computer Corp. of America, a non-SQL-based DBMS vendor, has offered Text/204 for a few years now. Oracle Corp., Relational Technology, Inc. and Informix Software, Inc. are also working on or have introduced text offerings.

Perhaps most active are the major hardware vendors. Digital Equipment Corp., although it has relationships with text vendors such as Henco, has laid out its Compound Document Architecture, which is its foundation for managing compound documents. IBM is expected to announce text-handling capabilities in its anticipated Systems Application Architecture Office software, replacing its old Stairs product.

On the other end, Philippe Garcin, vice-president of marketing at Henco, said the next release of Info DB — scheduled for next year — will incorporate SQL as a back end to access information from SQL-based databases. The first will be DEC's RDB.

Allied-Bendix's Frick, who uses Oracle as well as Info DB, says each has its own strengths. With Info DB, Frick says that on average, end users need only "four hours instruction and a manual, and away they go." One of its most appealing aspects is its friendly language, which allows applications to be developed quickly, he said.

While both vendors and users envision a multimedia database that incorporates all types of data — image, voice and video as well as text and structured data — for now, most systems require that an image or other free-form nontext data be related to a document or entered with a description tag so it can be searched on that. Just as SQL has become a standard for working with structured data, standards for nonstructured data are needed before this area really moves ahead, they said.

NEW PRODUCTS — SOFTWARE

Applications packages

Interactive Software Services, Inc. has reportedly added a general ledger module to AMIS/Modeling, the company's three-dimensional decision support system.

Designed for IBM Application System/400 and System/38 midrange systems, AMIS/GL allows the user to make additional detailed journal entries at the transaction level, according to the vendor. The combined AMIS/Modeling and AMIS/GL package is priced at $65,000. Training and hot-line support are provided.

Interactive Software Services
Suite 306
4825 N. Scott St.
Schiller Park, Ill. 60176
800-288-8550

Suntex National Corp. has announced The Venture Analyst, an add-on product for users of SCO Professional, The Santa Cruz Operation's integrated spreadsheet, graphics and database package.

The product runs in the Xenix/Unix operating environment and reportedly evaluates existing business and new opportunities in manufacturing, commercial real estate and service industries. The product can be used to prepare business plans, buy or sell businesses, forecast operations and develop budgets. It is priced at $365.

Suntex National
P.O. Box 772868
Houston, Texas 77215
713-783-9059

Epic Data, Inc. has announced a data collection software package designed to operate on any Digital Equipment Corp. computer running under VMS, the company said.

The VMS Controller Software program reportedly allows any VAX user to incorporate data collection functions into their systems without the use of special hardware.

Features reportedly include terminal polling, redundant operation at the party-line level, sequencing and data packing. A typical configuration costs approximately $10,000.

Epic Data
7280 River Road
Richmond, B.C., Canada V6X 1X5
604-273-9146

Computer Horizons Corp. has announced the Trust-1 Bank software system for trust and custody applications.

The IBM mainframe software program reportedly runs in the MVS operating environment and can serve as a foundation for a range of customized personal trust, master trust and custody services, the vendor said. The software program can also be purchased as an off-the-shelf product. It is priced on a customer proposal basis, depending on individual requirements and configurations.

Computer Horizons
747 Third Ave.
15th Floor
New York, N.Y. 10017
212-371-9600

Information Science, Inc. has released an enhanced version of its Classic Human Resource Management System software for IBM mainframes.

The software has reportedly been upgraded to include data security features, help facilities and native CICS on-line access to payroll and personnel functions throughout the system. Release 11.0 is priced from $50,000 to $150,000, depending on configuration.

Information Science
95 Chestnut Ridge Road
Montvale, N.J. 07645
201-391-1600

Unipress Software, Inc. has introduced a version of Santa Cruz Operation's Lyrix 5.0.4 word processing system for Sun Microsystems, Inc. Sun-3 workstations.

The software program will be distributed through Unimarket, the company's Unix software distribution division. Lyrix 5.0.4 reportedly allows users to customize menu messages by editing the Lyrix file command. Other features include "point-and-pick" document editing, mail-merge and a built-in spell checker.

The package is priced at $595. A medical dictionary and legal dictionary can be purchased for an additional $150 each.

Unipress Software
2025 Lincoln Highway
Edison, N.J. 08817
201-985-8000

MCBA, Inc. has released three Classic Manufacturing Software packages for Unix-based systems.

Currently running on NCR Corp.'s Tower Series and Motorola, Inc. 680X0-based processors, the packages — Classic Standard Routing, Classic Standard Product Costing and Classic Labor Performance — form part of the company's integrated 19-package manufacturing resource planning systems. They are particularly suited for discrete, repetitive manufacturing operations and job shops, the vendor said.

Pricing ranges from $1,000 to $6,000 per package, depending on hardware platform.

MCBA
425 W. Broadway
Glendale, Calif. 91204
818-242-9600

How to stay on top of major undertakings.

Get Project Workbench®-Advanced System from Software Spectrum for just $825.

As project manager, your job is to keep things under control. But when you've got dozens of interrelated variables to manage, that's no easy task. First, you rack your brain to put all your resources into a logical plan of attack. And then something comes along that throws your plan off schedule.

When you're ready to fight back, get Project Workbench-Advanced System Release 3.0. It's the one microcomputer software package that combines all the tools you need to more efficiently plan, track and execute your projects. No matter how complex those projects might be.

In minutes, Project Workbench's Autoschedule feature lets you do what would take hours to accomplish by hand. Just input your data and the program automatically creates your optimum project schedule. Project Workbench also gives you unlimited "what-if" capability, strong resource management functions, context sensitive help, presentation-quality graphics and much more. There's even an Interactive Gantt Chart and Resource Spreadsheet that run on a single screen.

Software Spectrum's price for Project Workbench-Advanced System is more than $400 below suggested retail. And our service is unmatched by any other source in our industry.

So don't let the projects under your control get control over you. Find out more about Project Workbench right away. For your free demonstration disk, or to open a corporate account, call Software Spectrum at 1-800-624-0503.*

SOFTWARE SPECTRUM

10420 Miller Road • Dallas, Texas 75238 • 800-624-0503. *In the Midwest 800-445-6454.

Project Workbench is a registered trademark of Applied Business Technology Corporation.

MICRO BITS

Douglas Barney

Nothing like the real thing

MCA clones? Bah! Eager IBM rivals know that nobody likes or buys Micro Channel Architecture (MCA) clones. That is why they call the IBM Micro Channel line a failure. But the troubles of MCA cloners are no reason to ridicule it. Instead, it's a good reason to dig into the strange market forces that give MCA — but none of its clones — appeal.

The self-appointed industry know-it-alls who still make fun of MCA because it has shown no advantages over the AT bus are exactly right. No mealy-mouthed IBM sales hype will change this sad fact, either. But this lack of substance is hurting the clones — not sales of the real thing.

People will happily buy IBM machines that don't accept old cards and don't seem to do anything extraordinary, simply because they believe in the promise. "Someday, the Micro Channel will be exploited, and I'll be ready," these customers think.

Based on reported board developments, these customers were not hornswoggled.

Continued on page 47

Measuring the value of PCs

Research finds a high return on investment, but the payoff takes time

BY MICHAEL ALEXANDER
CW STAFF

The payback for companies that focus on using personal computers as a strategic resource can be as high as 10 times the original investment, according to a recent study.

KPMG Peat Marwick Consulting Group and its research branch, Nolan Norton Research Institute, concluded in a joint study that the return on investment (ROI) in PCs can be substantial if end-user computing is linked to corporate strategy and not merely used to automate business processes.

Jan Duffy, a partner at KPMG Peat Marwick's information technology practice, said, "With planned strategy and effective management, companies can expect to improve the bottom line by as much as 10 times its [end-user computing] investment. In this way, they can expect to utilize technology to improve productivity and gain competitive advantage, fueling growth and higher profits."

"The 10-times return on investment seems high to me, though the potential is certainly there," said Bruce Ferland, senior vice-president and information systems division manager at the Boston Safe Deposit and Trust Co. in Boston. "If you are replacing manual processes with, say, a PC running Lotus' 1-2-3 or something like that, you could probably incur a 10-times return."

For the moment, most organizations measure their success in end-user computing in terms of penetration level and benefits resulting from automating business processes.

"Most PC technology is focused on task automation, which only produces bubble-up benefits," Duffy said. Corporations seldom reap the benefits in time savings or increased efficiency that come from automation. Instead, these benefits "rise like bubbles, burst and then disappear," she added. "Companies can expect measurable improvements in individual productivity, but this narrow focus will limit the ROI to only 20%."

The real value of end-user computing is when it is used to make improvements that can be measured in such ways as inventory turnover, sales per support staffer, product development time and percentage of customer problems resolved in one telephone call, Duffy said.

Though end-user computing has a significant presence in many companies — with an overall penetration rate of 20% — few firms realize the strategic importance of the information flowing within their organizations, researchers said. "While they have made considerable investments in computer technology, they are not taking advantage of the technology," Duffy noted.

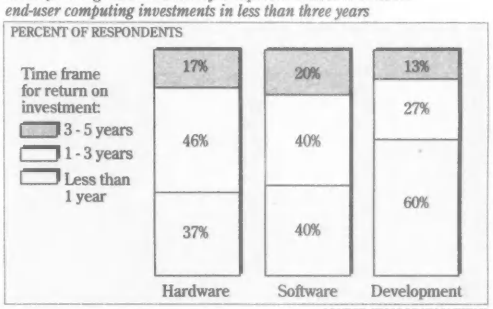
Most organizations expect to achieve an ROI within the first 12 months of implementation, with the longest time frame for return being five years.

"We look at a return on in-

Continued on page 47

PC payback

Most of the organizations surveyed expect to realize returns on end-user computing investments in less than three years



SOURCE: KPMG PEAT MARWICK
CW CHART: JOHN YORK

Firm brings a PC touch to lost data

ON SITE

BY WILLIAM BRANDEL
CW STAFF

NEW YORK — Supporting users in a competitive business is one thing. But when you add in the job of making mainframe-based applications look and feel like those on a personal computer, it might give some PC managers a little more than pause.

New York-based McGraw-Hill, Inc. financial products subsidiary Data Resources, Inc./McGraw-Hill supports users of its on-line trading information and its own in-house brokerage operations. The group faces the challenge of packaging both mainframe and PC-based applications into a PC environment.

"PCs are critical to anyone in a financially based industry," said Sam Solomon, vice-president of the financial institutions group. "When we try to violate that personal aspect with systems that are centralized, users tend to step back and say, 'We

Continued on page 44

Inside

- Microrim maps out plans for Atlas II. Page 39.
- Harris' Aerospace division puts new project management tool to work. Page 39.
- Xerox targets electronic forms market. Page 42.

Is "the system" hampering the productivity of your CICS Programmers?

- Poor CICS Response Time?
- Lack of CICS Debugging Tools?
- Frequent Region Crashes?
- Transactions Hung Until Nightly Recycle?
- Restrictions on CICS Test Region Time?
- Can't Refresh Test Regions When Needed?
- Limited Updates to CICS Tables?
- The Horror of CICS Dumps?

Thousands of CICS programmers have already **beaten the system** with **Micro Focus COBOL/2 Workbench™ and the CICS Option.** They're developing full-scale CICS/VS and CICS DL/I applications (with optional DL/I support) on their PC Workstations.

Workbench and the CICS Option provide the CICS application programmer with a powerful development environment. A full set of development and testing tools includes an integrated CICS Command Level preprocessor, CICS and 3270 emulation, a screen development facility to generate or import BMS macros, FCT and PCT table maintenance, and visual source code debugging using **ANIMATOR™**, the industry's best COBOL and CICS debugger.

For more information about Micro Focus COBOL/2 Workbench and the CICS Option call us now:

1-800-872-6265

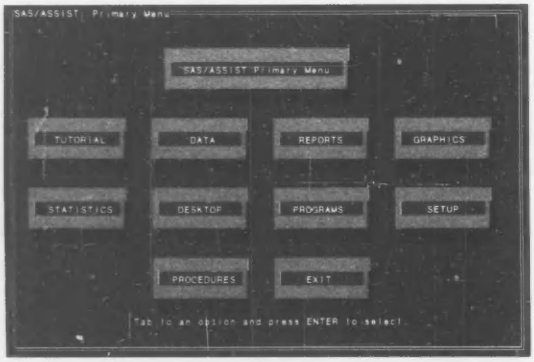
Micro Focus COBOL/2 Workbench and the CICS Option: Mainframe Technology, but PC Productivity. Now!

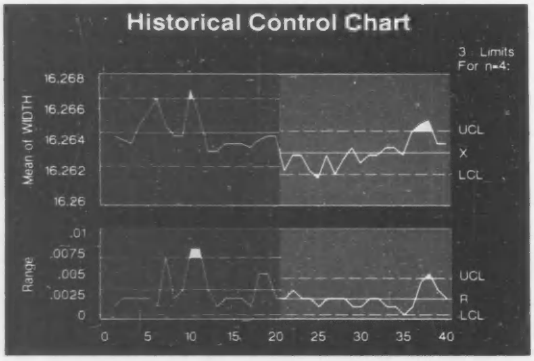
MICRO FOCUS®

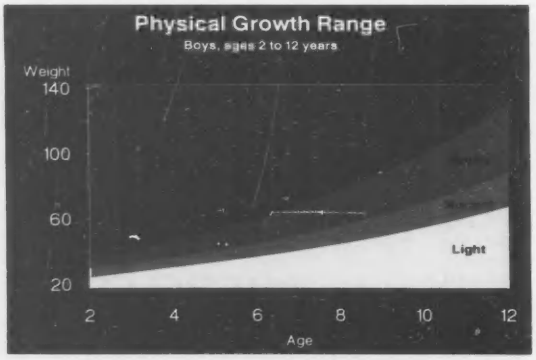
A Better Way of Programming™

The SAS® System

More Choices, for More Applications, than Any Other Software.







The SAS System is the software you'll never outgrow. No other software offers so many choices for data management, analysis, and presentation. For any user— new computer user to seasoned pro. For any environment—PC to technical workstation to minicomputer to mainframe.

Choices to Build On. Start with a powerful English-like language and essential data management tools. Then take your pick of ready-to-use applications: statistical and mathematical analysis...report writing and color graphics...project management and quality control... forecasting and decision support.

Or build your own menu-driven applications— quickly and easily— with the SAS System's interactive applications development tool. Even first-time users can command the power of the SAS System... just by filling in the blanks.

Choices to Count On. More than a million users throughout the world— in business, industry, government, science, and education— have made the SAS System their #1 choice for data analysis and color graphics. And **every** SAS System application is backed by expert technical support, documentation, and training.

We'll tell you more in a free 12-page executive summary. Just give us a call at (919) 467-8000. In Canada, call (416) 443-9811.

SAS®

SAS Institute Inc.
Software Sales Department
SAS Circle ☐ Box 8000
Cary, NC 27512-8000
Fax (919) 469-3737

The SAS System runs under IBM Corp.'s MVS, CMS, and VSE; Digital Equipment Corp.'s VMS®; Data General Corp.'s AOS/VS; Prime Computer, Inc.'s PRIMOS®; Sun Microsystems, Inc.'s SunOS™; Hewlett-Packard's HP-UX; Microsoft Corp.'s MS-DOS®; and IBM Corp.'s PC DOS.

Copyright © 1988 by SAS Institute Inc. Printed in the USA.

MAC NUGGETS

Julie Pitta

Apple bides its time on RISC move

Is Apple ready to take a RISC? Not yet, says Apple Chairman and Chief Executive John Sculley.

At the recent introduction of the Mac IICX — Apple's latest Motorola 68030-based Mac — Sculley said Apple is in no hurry to jump into the reduced instruction set computing (RISC) wars.

"The Mac is not dependent on speed," he maintained. "The race for speed is going on largely in the technical workstations market. We are a personal computing company."

Something up its sleeve

However, Sculley confirmed that there are "several" RISC projects within the company. Which RISC processor Apple will choose has been a topic of much debate.

"The rumor has it that they've evaluated everything from [Sun Microsystems'] Sparc to Integraph's Clipper," one industry watcher says.

Longtime Apple vendor Motorola was the early favorite to supply a RISC processor for the Mac. However, Motorola's 88000 has apparently fallen out of favor with Apple evaluators, who have judged it too slow. Also, the original design team for the 88000 left Motorola to form Ross Technologies, which was recently purchased by Cypress Semiconductor to lead Cypress' RISC efforts. Cypress has licensed Sun's Scalable Processor Architecture (Sparc).

Mips Computer Systems, the choice of Apple's strategic partner DEC, appears to have grabbed Apple's attention. The Mips processor is believed by many to be speedier than the 88000 and Sparc.

David Burdick, a vice-president at market research firm Dataquest, Inc. in San Jose, Calif., predicts that Apple will outline its RISC strategy before year's end. If so, the announcement will be several months after introductions from Apollo, DEC and Data General, not to mention a year after Sun's first Sparc introduction. It is likely to take a couple of years before software is ported to the new platform.

However, as does Sculley,

Continued on page 42

Microrim's DBMS treads common ground

ANALYSIS

BY PATRICK WAURZYNIAK
CW STAFF

Microrim, Inc.'s plans to branch out into the workstation, minicomputer and mainframe DBMS markets with a common product has hit home with some personal computer users.

The ambitious project, known as Atlas II, will appear as a multiuser database management system under OS/2 later this year. The back-end engine will also be ported to key mini and mainframe architectures as part of a development plan stretching through the early 1990s.

Meanwhile, users of Microrim's R:Base personal computer database program seem to be leaning toward migrating their DOS-based PC applications to Atlas when the relational DBMS bows under OS/2. The move to more powerful architectures is set for 1990 or 1991.

Atlas, which adheres to the ANSI Level 2 version of SQL, will reportedly also include extensions to IBM's DB2 Systems Application Architecture (SAA). Atlas is expected to use the client-server architecture and to be highly portable across other architectures by using essentially the same graphics and database kernel in each environment.

Microrim decided to announce its plans to introduce a DBMS solution for enterprisewide data sharing following discussions with more than 300 information executives, President David F. Hull said. The executives said that current DBMS software that is designed to support enterprisewide data sharing is too difficult to learn and performs too slowly for PC users, Hull said.

"We'll be very interested in looking at it closer," said Ralph Sampson, director of telecommunications at McKesson Corp. in San Francisco. "It looks like they're headed in the right direction, particularly in regard to their ability to access information on a host, a local-area network or on an individual workstation."

Although McKesson currently has only experimental applications of R:Base running on IBM Personal System/2s, Sampson said the firm's strategies for Atlas appear attractive for future uses at McKesson, which is a heavy user of IBM mainframes and PS/2s.

Not where, but how

Sampson, whose group uses R:Base V for inventory management of computers and network components, added, "I really don't care where the information resides; just let me get to it with a few keystrokes. I don't want to have to be a guru to do that."

Barbara Hunt, supervisor of a database management group doing research and development at Anaheim, Calif.-based Fujitsu Business Communication Systems, said her R&D operation uses R:Base under MS-DOS and is interested in using the proposed Unix-based versions of Atlas on workstations or Digital Equipment Corp. VAX systems.

"We've been trying to base some decisions on what to go to for the next few years," said Hunt, whose group's Intel Corp.

MICRORIM DECIDED to announce plans for a DBMS solution to enterprisewide data sharing after discussions with 300 information executives, Hull said.

80286-based PCs currently lack the Unix-type multitasking capabilities that she prefers. "We want to stay with R:Base and use the systems we have in place. If Microrim is going to have a database running under the Unix operating system, we want to stay with R:Base."

At Superior National Insurance Co., a Woodland Hills, Calif.-based commercial insurance company, consultant Linda Nelson plans to implement Atlas when it comes out for IBM Application System/400 machines.

"We need it; there's no doubt about it," stated Nelson, who said all of the company's applications are on eight Novell, Inc. servers connected to about 120 PCs on a LAN.

"Microrim guaranteed that our data will be migratable to Atlas," Nelson said, noting that she does not want to rewrite applications for Atlas but wants to keep Atlas on the PCs even if the company moves to AS/400s.

Karen Offermann, an analyst at research firm Datapro in Delran, N.J., said, "I don't think Atlas will be sold on the benefits of user interface, but the user interface is part of the picture. It's a good strategy for others to replicate."

At Framingham, Mass.-based market research firm International Data Corp., PC software program manager Nancy McSharry estimated Microrim holds about 5% of the PC database market with 250,000 to 300,000 R:Base copies installed.

"I think it's a very smart move on Microrim's part," McSharry said. "They've always been a good, strong company in the PC market, but the company is just seeing the way the world is going and is making the adjustments. If the products are implemented as they say they will, everything looks good on paper."

Aerospace firm test-fires time-planning software

BY SALLY CUSACK
CW STAFF

MELBOURNE, Fla. — Harris Corp.'s Government Aerospace Division has played a part in every U.S. space program since the days of Telstar. This includes the Apollo, Mercury and Gemini programs as well as the ongoing shuttle missions.

Specializing in custom aircraft, spaceborne communications and information systems, the Melbourne-based division develops its mission-critical technology in a high-security environment. Clear communication between project team members and strict adherence to scheduling and project planning activities are crucial.

Several division managers at Harris Aerospace are currently using a personal computer-based executive management software program from San Francisco-based Chronos Software, Inc. to optimize self-management and departmental productivity.

Howard Green has been with Harris for 13 years and currently serves as an engineering manager. Approximately six months ago, he began looking for a project management package for his IBM Personal Computer AT-compatible system.

"Originally, I got hooked on a shareware program a fellow brought in," Green says. "I liked it so much I spoke with an administrator in the section about getting my own legal copy of the product. When that proved impossible, he started looking into other things."

Test pattern

The division evaluated several packages, including Persoft, Inc.'s IZE, Micro Logic Corp.'s Tornado and Agenda from Lotus Development Corp. The section finally decided on Who-What-When from Chronos because it did not seem too complex or elaborate.

The package focuses on three interrelated aspects: people, project and time management. Features include a daily calendar page, project management displays with milestone and deadline markers and automated management reporting capabilities.

Every morning, Green runs a copy of his personal calendar and hands it to his secretary. "I tell her, 'This is what I think I'm doing today,' and she tells me if I'm right," he said. "The necessary modifications are made, and I don't worry about remembering — or more importantly —prioritizing my schedule. I can look at what has to be done and assign times and dates to priority projects."

Green said that the package also comes in handy when he and his associates want to review and modify project plans as they appear on the computer screen. Dates can be established for projects and checked immediately for time gaps. Alterations are easily made, and hard copies of the plan can quickly be distributed.

The software package incorporates Gantt charts that reportedly zoom from overview to daily view modes, and a weekly overview displays daily time bars that indicate both free and committed time spaces.

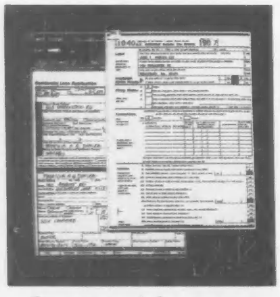
According to the vendor, the user can arrange group meetings simply by indicating the persons involved. The program will automatically flag any scheduling conflicts on screen.

The managers at Harris are waiting for networking functions to be completed to get the software system going full speed. Green said the program is very easy to learn, though he feels that the documentation could be more specific.

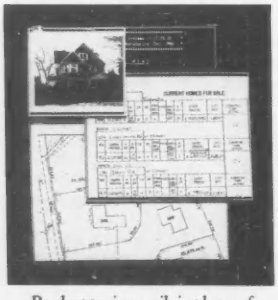
The program requires an IBM PC XT, AT, Personal System/2 or compatible running MS-DOS 2.1 or later and a minimum of 512K bytes of random-access memory. A hard disk is recommended but not required.

Who-What-When is not copy-protected and carries a current list price of $189.95.

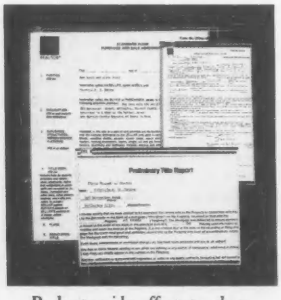
CAN A BETTER IMAGE IMPROVE CUSTOMER SERVICE? BANK ON IT.



Customer comes in for a mortgage. Has a loan application, tax returns.



Bank appraiser mails in photos of property, plot plan and comparables.



Broker provides offer to purchase, preliminary title report, and P&S agreement by FAX.

Credit information arrives, added to client portfolio.

Actual Wang computer screens shown here.

Paper and patience.

Until now, you couldn't process a loan application without them.

But with Wang's Integrated Image System, you can now process a loan from start to finish right at your desk in half the time.

INTEGRATED IMAGING

WIIS gives loan officers immediate access to all the information they need, where they need it, when they need it.

With the press of a button up comes an image window, text window and data window. Simultaneously. And it's integrated information. With your FAX machine. Your electronic mail. Your company's computer system.

Wang's Integrated Image System.

It will not only improve your image, it will improve your customer service. And you can take that to the bank.

Entire package – data, text, image – is sent to originating office via electronic mail for committee approval. Decision is made in half the time. That's Integrated Imaging from Wang.

WANG

MAKES IT WORK

For more information, contact your local Wang Sales Office.
Or write Wang Laboratories, Attn: Inquiry Service, M.S. 014-03C, One Industrial Avenue, Lowell, MA 01851. © 1989 Wang Laboratories, Inc.

Xerox unit goes for forms-processing window

BY SALLY CUSACK
CW STAFF

SAN DIEGO — Forms currently make up 33% of all business documents, and electronic forms-publishing sales in the U.S. could approach the $3 billion mark, according to market research firm Dataquest, Inc.

In anticipation of the predicted growth in the forms market, Xerox Corp.'s Desktop Software Business Unit last week announced forms-processing software designed to run in the Microsoft Corp. Windows environment.

Formbase runs on IBM Personal Computer ATs and compatibles as well as Intel Corp. 80386-based machines.

Operating under Windows, the product reportedly employs a mouse-driven graphical user interface that integrates a forms-drawing package and a relational database management facility.

The software is targeted at the average PC-literate person who wants to create customized forms and databases without programming, according to Arthur E. Coles, Xerox vice-president and general manager.

The program accepts data, text and graphics, including scanned images and logos. The user defines the database by simply drawing the form, Coles said, adding that its capabilities make the package ideal for professionals in the forms-manufacturing, design and graphics arts industries.

Forms modification

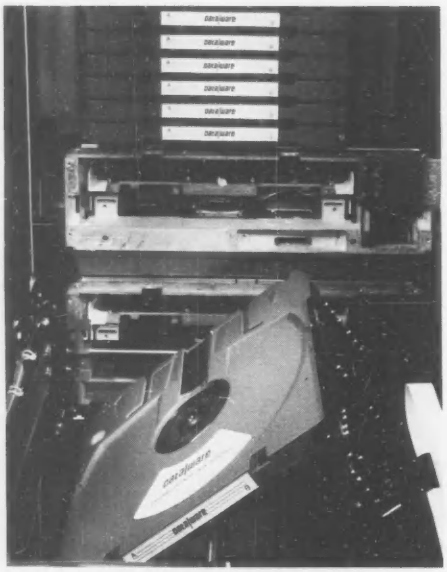
Generated forms can be modified even during data entry, the company said, and data is organized by the software. The user reportedly does not need to employ data or screen definitions or report generation languages. Different forms and related data can be linked or cut and pasted together.

The software also reportedly allows users to perform relational database functions and import and export data with PC products such as Microsoft's Excel, Lotus Development Corp.'s 1-2-3 and Ashton-Tate Corp.'s Dbase III.

Features reportedly include a built-in word processor, search-and-sort and mail-merge. A variety of fonts, sizes and colors and other graphical elements are also provided.

Currently in beta testing, Formbase is scheduled to ship in June and costs $495, according to the vendor.

S/370 Optical Storage



Hundreds of Gigabytes Online

The DW 34800 OSS puts your data online for multiple users.

Consider these facts:

MAINFRAME PLUG COMPATIBILITY

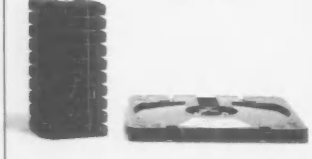
Data/Ware's DW 34800 Optical Storage Subsystem plugs directly into IBM S/370 and PCM systems. It attaches to the standard Bus and Tag I/O channel of your mainframe and provides you with automated optical disk libraries that operate unattended.

HIGH STORAGE CAPACITY

Data storage capacities from 190 to *760 gigabytes* are ordinary tasks for the DW 34800. Its flexible configurations include up to four libraries and sixteen optical disk drives.

DIRECT RECORD ACCESS

The DW 34800 OSS is fast. It provides you average *direct record access* to any data on a drive-mounted disk in only 150 milliseconds. Automated retrieval of an optical disk in the robotic library takes less than nine seconds. The DW 34800's internal cache memory provides for buffered read/write I/O channel transfers at up to *4.5 megabytes per second.*



PERMANENTLY STORED DATA

The permanence of your optically-stored image or coded information is assured by laser beam recording. The laser permanently records all data on the specially metallized surface of rugged 12-inch diameter, glass optical disks. New or updated data generated by your host mainframe are written to unused areas of the disk.

IBM is a registered trademark of International Business Machines Corporation.

MULTIUSER SHARED ACCESS

Data/Ware's Mainframe Optical Document Storage and Retrieval System Software is available to aid the integration of the DW 34800 OSS into your document storage and retrieval environment. The MDRS software package provides shared direct access to your optically-stored data via high-level languages as well as multiuser query capability from *TSO, CICS, IMS,* or any *VTAM* telecommunications systems.

FIELD SERVICE SUPPORT

Data/Ware's maintenance partnership with National Advanced Systems assures a network of DW 34800 parts and service that will meet your needs at any OSS installation 365 days a year.

That's just the beginning. *There's a lot more to tell.*

For further facts about the benefits of optical storage using the DW 34800 OSS, call Gary Holtwick, at

data/ware DEVELOPMENT, INC.

9449 Carroll Park Drive
San Diego, CA 92121
Telephone (619) 453-7660
FAX: (619) 453-2794

Pitta

FROM PAGE 39

Burdick thinks Apple can afford to ignore the hype surrounding RISC machines.

"I don't think the RISC hype has reached Apple's market," he explains. "It's the performance-sensitive applications — the technical applications — that are the early adopters of a new computing technology."

Much has been made of converging courses set by Apple and Sun — two stars of the Silicon Valley. Is Apple's failure to move to RISC, with Sun being an early adopter, going to hurt Apple?

No, according to Burdick. "I think there's more of a case that Apple's cutting into Sun's market rather than the other way around," he says. While Apple has made some inroads with engineers, Sun has failed to capture the interest of personal computer users. It is expected to make another stab at them with Open Look, a graphical user interface based on Xerox's Star, which was "borrowed" for the Mac.

Sculley displays Apple's usual bravado when discussing his competitors. "We are not in a speed race with anyone," he said. "Nor do we feel any great pressure to compete in any areas other than those that have been our strength."

Pitta is *Computerworld's* West Coast senior correspondent.

WITH SO MANY DIFFERENT OPERATING SYSTEMS TO CHOOSE FROM, WHERE DO YOU DRAW THE LINE?

PC touch

CONTINUED FROM PAGE 37

don't want it.' "

At McGraw-Hill, the brokers in the trading group rely on a systems-integrated application area called analytics, which can be used to display and report financial data to a broker or perform complex interactive statistical presentations. Wall Street brokers base million-dollar decisions on these, Solomon said.

Analytics are integrated software applications that merge spreadsheets, real-time data feeds and mainframe database access into one graphic presentation on the user's screen. Analytics essentially allow the broker to harness different types of data that they choose as integral market factors, which are then packaged into a meaningful form on their personal computer screens.

But traders do not just want information; they also want to control it. "In business, we tend to ignore the fact that there is that personal relationship between the user and the machine," Solomon said. "Granted, you can't have all your data on a PC. Some of it has to be on the mainframe, but the user wants that PC interface as the front end. He wants that PC environment."

So Solomon's group is also trying to change its standard user interface to a PC interface. At issue is whether the group can give the interface a procedure-based function without appearing to the user as a mainframe interface.

Solomon said that his group is now moving toward a less procedural approach that will blend the best of the traditional Lotus Development Corp. 1-2-3-style interface with newer graphical technologies such as pull-down menus, mouse support and dialog boxes. This, Solomon said, will give users the feeling that they are liberated from the mainframe but are still masters of their data.

Similar approach

"The interface we're using does not imitate the mainframe but provides a lot of the same procedural approaches," Solomon said. Instead of being icon- or object-based, the broker's interface is made up of menus and forms.

"We've found that they are used to an environment that is very procedural. Think about when people want to do analysis," Solomon said. "When you're on the mainframe, everything by nature is procedural. You have to do X before Y in terms of your interaction with the mainframe session. What PCs allow you to do is change that order, get away from the procedurality."

He cites the example of a user who may want to write a report but decides to create a graph first. But before he creates the graph, he wants more data analysis. "That freedom can only be attained with PCs. Mainframes tend to force you into a certain task instead of performing it for the user," Solomon said.

"When you consider the data-intensity of finance, you can see why the operating system of Wall Street is Lotus' 1-2-3, not DOS," he said. "Our information is not textual; it is numbers and graphs, which is very typical of the financial industry."

"It's funny how we as an industry have come full circle in systems integration," Solomon said. "Ten years ago, we were talking about time-sharing machines for decision-support applications. Now, we have these same decision-support applications, but now they are PC-based."

A minor change

The issues of decision-support applications that help decision makers with analytics are still the same as interactive computing on the mainframe. "All that's changed is the interface. It's a PC," Solomon said.

"We can't force major changes in desktop technologies on our traders for our own purposes," he said. "As a result, we lag the market in gee-whiz technology. We're lucky if we can get people to change their peripherals. But we can't change their PC or the way they use it. So our standards are wrapped around the existing technology."

Solomon is now concentrating his technological efforts on storage, networking and systems integration. "This is so important for us as an applications-oriented group, as we can't build all our own products," he said. "Anywhere I can go out and find existing technology that generically does the job and can then be adapted to our capabilities, I'll do it."

Because of the constant user demand for data, Solomon said McGraw Hill is investigating write-once read-many (WORM) technology. WORM drives would allow users to access and store a larger cache of data on their PC. Large non-volatile storage, such as on Steve Jobs' Next, Inc. machine, is the right direction for data-intensive personal computing for financial users, Solomon said.

"We have to combine local storage with communications," he said, adding that after experimenting with CD-ROM technology, he is now more enthusiastic about WORM technology. "It's an issue of press time— a pure publishing issue," Solomon said, noting that in the high-finance industry, information must be reported and distributed daily, or it is irrelevant to the customers.

"Financial data has a very limited shelf life," he said. "If it takes me a day to turn around the mastering, two days to finish up production, and three days to ship, the data is a week old by the time it's out there. It's not news anymore. With WORM technology, I can be downloading updates every day and directly pressing those onto the existing CD technology."

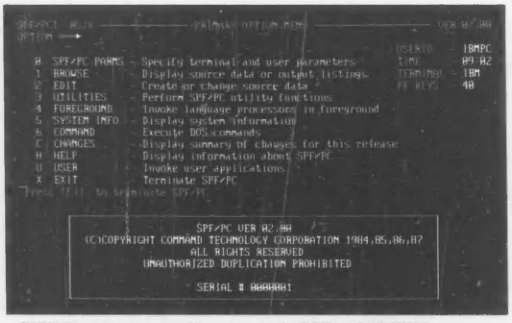
Mainframe Muscle for your PC

SPF/PC™ 2.0

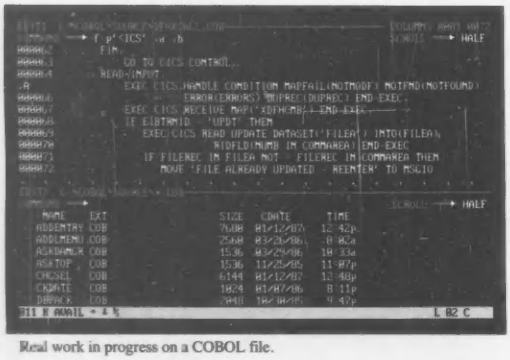
Now you can re-create the mainframe editing environment on your own IBM PC with SPF/PC, the only PC editor functionally equivalent to editing on the IBM mainframe with ISPF/PDF, Version 2, Release 2.

Files of virtually any size may be edited with SPF/PC because it uses all extended or expanded memory, or disk drive work space.

Mainframe users will especially appreciate SPF/PC's familiar commands, fast PC processing, and micro-to-mainframe file portability.


OPTION ===>
0 SPF/PC PARMS - Specify terminal and user parameters
1 BROWSE - Display source data or output listings
2 EDIT - Create or change source data
3 UTILITIES - Perform SPF/PC utility functions
4 FOREGROUND - Invoke language processors in foreground
5 SYSTEM INFO - Display system information
6 COMMAND - Execute DOS commands
C CHANGES - Display summary of changes for this release
H HELP - Display information about SPF/PC
U USER - Invoke user applications
X EXIT - Terminate SPF/PC
SPF/PC VER 02.00
(C)COPYRIGHT COMMAND TECHNOLOGY CORPORATION 1984,85,86,87
ALL RIGHTS RESERVED
UNAUTHORIZED DUPLICATION PROHIBITED

SPF/PC's main menu provides access to the EDIT and BROWSE facilities; utilities for file MOVE, COPY, RENAME, etc.; facilities to access other programs; on-line HELP and more.



Real work in progress on a COBOL file.

A few other SPF/PC enhancements:

- true split screen
- directory/member lists
- binary file editing
- picture strings
- hexadecimal editing
- 43-line EGA/50-line VGA support

SPF/PC runs under DOS on the IBM PC, XT, AT, PS/2 and all true compatibles; and in DOS emulation under OS/2. Native OS/2 support is in development.

Want proof? Ask us for a **free** interactive, demonstration diskette.

SPF/PC™ — so much like the real thing, you'll forget you're editing on a PC.

CTC®

Command Technology Corporation

1900 Mountain Boulevard, Oakland, California 94611 Telephone: (415) 339-3530 FAX:(415)339-3883

ANYWHERE YOU WANT.

At 3Com, we can take computers running any or all of the operating systems on this page and combine them into a single, integrated network.

Making incompatibility among operating system software virtually a non-issue.

Be it in workgroup, departmental or enterprise-wide networks.

In fact, we network more types of systems to more types of systems than anyone else.

Because we make more modular networking products than anyone else.

Everything from network operating systems to adapter boards to mainframe connections. Each one built upon a platform of leading industry standards. And each one designed with the flexibility to change as your needs change.

It's also reassuring to know that we offer a variety of comprehensive service and support options.

So take a look at your list of preferred vendors. If 3Com isn't on it, maybe you should call 1-800-NET-3Com, Dept. BF.

After all, you're going to have to draw the line somewhere.

3Com®

We network more types of systems to more types of systems.

"The Data General difference: the unparalleled speed, flexibility and availability of the MV/40000. Now, it's a triple threat."

With performance ranging from 14 to over 50 million instructions per second (MIPS), Data General's new MV/40000 and MV/40000 HA (High Availability) are two of the most powerful, flexible and reliable superminicomputers ever developed.

In either uni-processor or symmetric multi-processor configurations, they provide more than twice the performance of the nearest competition at a fraction of the cost.

Our innovative Data Sharing Architecture offers outstanding flexibility for distributed computing environments. So you can incrementally expand and adapt to meet your exacting commercial or technical computing needs. The MV/40000 computers are compatible with our broad range of MV family systems. They'll also interconnect with systems from other major vendors, to help protect your existing hardware investment.

Plus, an optional Message-Based Reliable Channel subsystem, designed for state-of-the-art maintainability, can be added to enhance system availability. It features on-line diagnostics and components that can be repaired or replaced under power, to maximize uptime.

To find out why the unique combination of speed, flexibility and availability of the MV/40000 and MV/40000 HA computers cannot be matched, send the coupon below.

Or call: 1-800-DATAGEN. In Canada, call 416-823-7830.

Data General

3400 Computer Drive, Dept. ADV/MV40/TT, Westboro, MA 01580

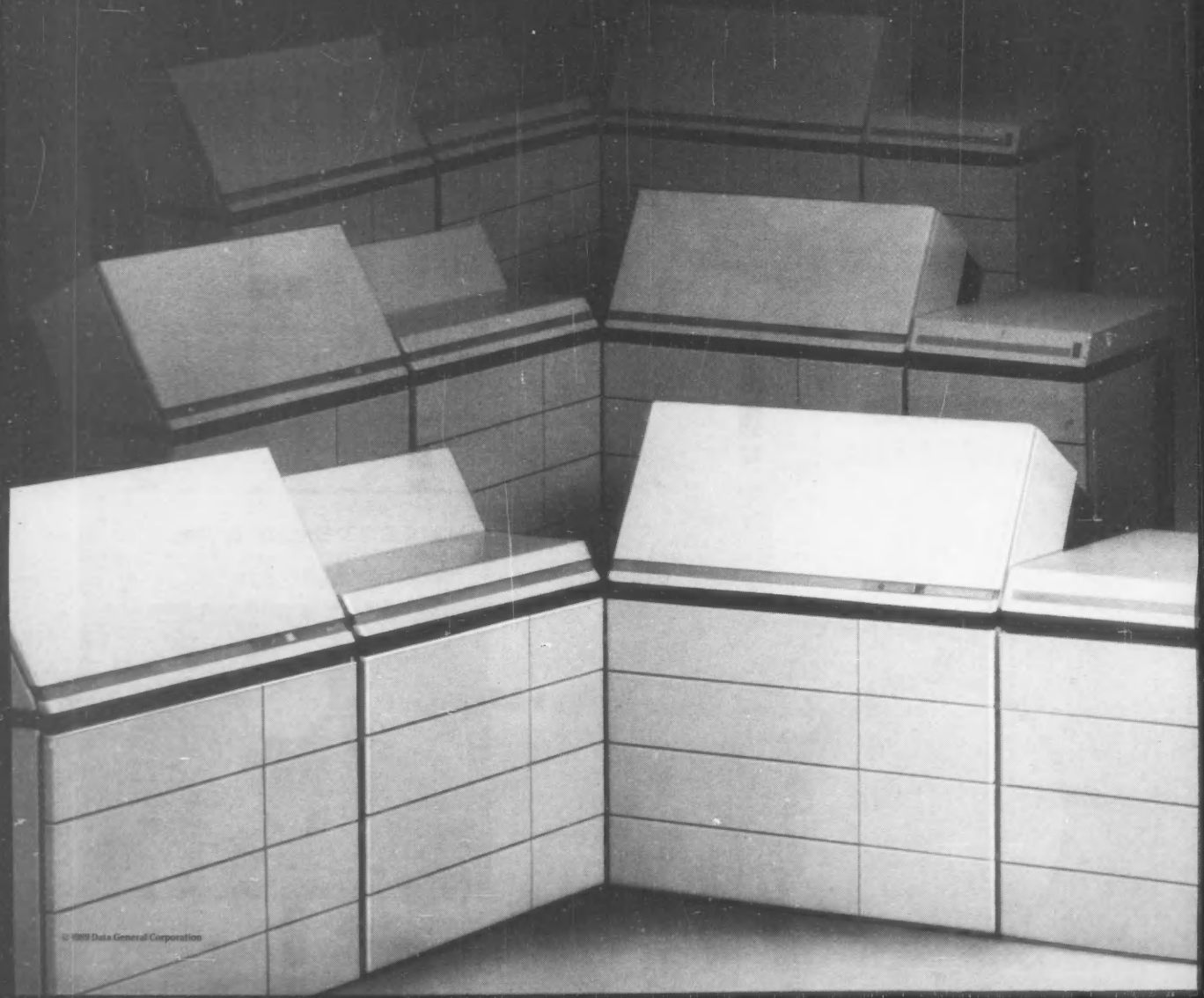
Name_____

Company_____

Address_____ Phone_____

City_____ State_____ Zip_____

CALL 1-800-DATAGEN



© 1989 Data General Corporation

Barney

CONTINUED FROM PAGE 37

MCA is an architecture for the future. That is precisely why it is too early to clone. The really wild stuff, such as bus-mastering cards that include the super-computer-like I860 Intel processor, will come and will flabbergast customers. But will clones be compatible with things that have not been released? Probably, although customers burned by early clones of the personal computer have that little bit of fear that maybe they won't.

Once a shipload of the advanced cards come out, the clones will be thoroughly tested. If they are compatible, people will buy lots of them. If not, we'll find them at Silicon Valley yard sales, real cheap.

Lotus/DBMS lives. Many expected that the long-awaited Lotus/DBMS (you remember this, don't you?) would be released in one big batch that would include the back-end server and an array of Presentation Manager-based front-end tools. Wrong!

Instead, soon after Lotus' 1-2-3 Release 3.0 is available this summer, Lotus will ship its communications specification, dubbed Blueprint, and its proprietary and already copywritten development language, Lotus Extended Application Facility (LEAF).

This is the start of the Lotus/DBMS system. Users will be able to tap into the Lotus engine using Release 3.0 and Blueprint and develop more custom applications using LEAF. Later, the graphical spreadsheet 1-2-3/G and the graphical querying, reporting and forms tools will follow. For those wary of Release 3.0, today's Release 2.01 and follow-on products will eventually tie into Lotus' overall database strategy by accessing Blueprint, officials pledged.

In another disclosure, Lotus said that starting with the shipment of 1-2-3 Release 3.0, all key Lotus products will begin to ship in three separate versions, including network server, node and stand-alone PC.

EISA come, EISA go, Part 2? According to a source familiar with the recently finished Extended Industry Standard Architecture bus connector, the system cannot handle the 100-MHz bus speeds its vendors claim it can. EISA systems reportedly cannot really hit speeds beyond 16 and 20 MHz, which today seems sluggish.

Get much beyond that, and you are asking the system to fail, the source said. Fortunately, they still have a few months to work out the problem, so the engineers best get cranking. But with talent like Gary Stimac involved — father of the Compaq 386 — the bus should be on course for its year-end destination. Then all they'll need is board support.

Barney is a *Computerworld* senior editor, PCs and workstations.

Value of PCs

CONTINUED FROM PAGE 37

vestment on a time horizon of about five years," Ferland said. "The break-even point is most probably within one to two years.

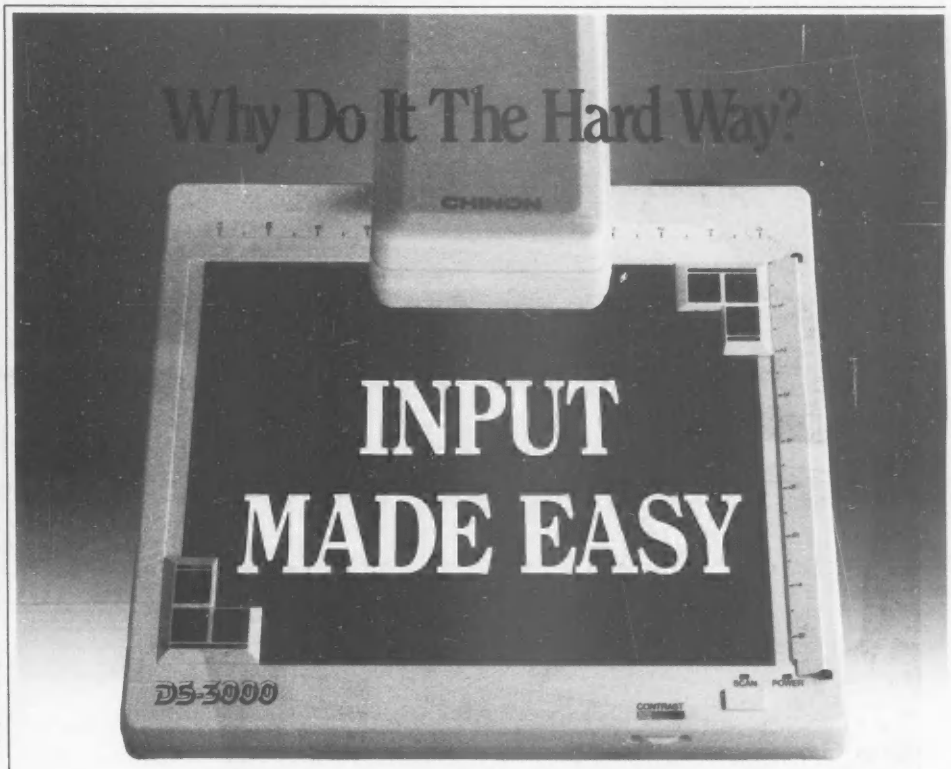
There is some debate about separating the ROI for software from that of hardware and also whether the length of the time for ROI on software should be shorter or longer than it is for hardware, Duffy said. The expected ROI time should not necessarily be fixed. Much will depend on whether the computing solution is designed to satisfy a one-time crisis or whether the investment is designed to supplement the overall strategic corporate business plan, in which case the ROI should be built into the plan and not be specifically related to technology acquisition.

It is not uncommon for organizations to expect that staff reductions will follow the installation of a new computer system, particularly when the investment is significant. But few companies carry through with staff reductions or even chart the use of PC technology after it has been put into use.

The management in most companies is not fully appreciative of information technology and is unaware of how to best manage its use, said Don Weidman, manager of end-user support services at Long Island Lighting in Hicksville, N.Y.: "We have had people justify PC budgets by saying they will need fewer people, but they are not doing away with jobs because of technology."

Nolan Norton based its research on the existance of four distinct evolutionary phases of end-user computing. The following phases, according to the researchers, reflect the degree to which an organization has integrated its technological and strategic business goals:

- Technical proficiency — when a company's early adopters of PCs become proficient at using them, although without apparent benefits.
- Task automation — when investments in technology are made with the intent of improving productivity. The ROI is 10% to 20%.
- Process automation — in which the company begins to network PCs and automate many processes. The benefits are three times the ROI.
- Business transformation — a stage when desktop computing has fully penetrated the business. It is at this level that the greatest benefit — 10 times the end-user computing investment — occurs.



DS-2000 and 3000:
The Affordable Scanners From Chinon.

Chinon's affordable new scanners could change forever the way computers are used. With OCR software you can input text without retyping it. With a simple add-in card, DS-2000/3000 turns your computer into an full-featured fax. And with the ability to scan almost any type of graphic image, DS-2000 and 3000 are perfect for desktop publishing.

Our scanner models offer different levels of scanning resolution so that you can have the scanner that's right for your applications-and your budget. The affordable DS-2000 is perfect for use as a fax or for scanning line art-applications where its 200 dpi resolution is quite adequate, and where speed may be more important. DS-3000, with its 300 dpi resolution, is better suited to OCR applications, or for scanning images for desktop publishing that require grey scale and higher resolution.

DS-2000 and 3000 are sold bundled with exciting software so that it's easy for you to get started. Discover how your computer can be more useful than ever before—discover DS-2000/3000. Call TOLL-FREE for the dealer nearest you.

CHINON

Chinon America, Inc.
660 Maple Ave.
Torrance, CA 90503
Toll-free (800) 441-0222
In Calif. (213) 533-0274

Which com

- Binary-compatible UNIX systems with th
- Delivered the most RISC processor

pany has:

broadest range of performance levels?
based UNIX workstations?

Intergraph's open UNIX® systems offer 4 to 20 MIPS performance and compatibility at the binary level. So, software running on one of our current workstations or servers will run on all future products. That means your investments are protected in applications software, databases, and personnel training. Plus, you can optimize workload to each particular workstation. And yes, we've shipped more than 20,000 CLIPPER® RISC processors.

To learn more about our binary-compatible UNIX systems, call 1-800-826-3515 in the U.S., 31-2503-66333 in the Netherlands, or 852-5-8661966 in Hong Kong.

INTERGRAPH

Intergraph and CLIPPER are registered trademarks of Intergraph Corporation.
UNIX is a registered trademark of AT&T.

NEW PRODUCTS

Software applications packages

A software system designed for the engineering and manufacturing industries has been introduced by Systech Corp.

The Systech Product Definition System was developed to improve the production and distribution process by providing the means to gather parts-list data and integrate it with other information, the vendor said.

The software runs on IBM Personal Computer ATs, Intel Corp. 80386-based machines and compatibles under MS-DOS. A single-user version is priced from $2,999.

Systech
61 Scott St.
Dix Hills, N.Y. 11746
516-595-2885

A statistical process control program for DOS-based personal computers is now available from Stochos, Inc.

Called Custom/QC 3.0, the program meets the quality assurance requirements of a variety of industries and combines analysis functions with presentation-quality graphics, the vendor said. The latest version reportedly features color windows and custom configuration capabilities.

Custom/QC 3.0 has a price tag of $500, which includes all utilities, a full-screen text editor, histogram and descriptive statistics and 13 control charts. A hard disk and 640K bytes of random-access memory are required, the company said.

Stochos
14 N. College St.
Schenectady, N.Y. 12305
800-426-4014

Dynamic Software has released Version 2 of the QPII Purchasing Management System. The modular software system was designed for the manufacturing purchasing environment and serves as a decision support tool for buyers and managers, the vendor said. The product incorporates a relational database management system.

The QPII software system requires an IBM Personal Computer, Personal System/2 or compatible, 640K bytes of random-access memory and a hard disk. A single-user version costs $995; the network version costs $2,985.

Dynamic Software
109 S. Main St.
Greer, S.C. 29651
803-877-1122

Macintosh products

Data Translation Services has announced Colorkit, a software product that works in conjunction with the company's Quick-capture frame grabber board for Apple Computer, Inc.'s Macintosh II computer.

The vendor said Colorkit permits the 256-gray-level board to capture 24-bit color images from red-green-blue video cameras and still-video devices. The products were designed for use in electronic publishing, color compositions, computer art and slide-making applications. Colorkit costs $295.

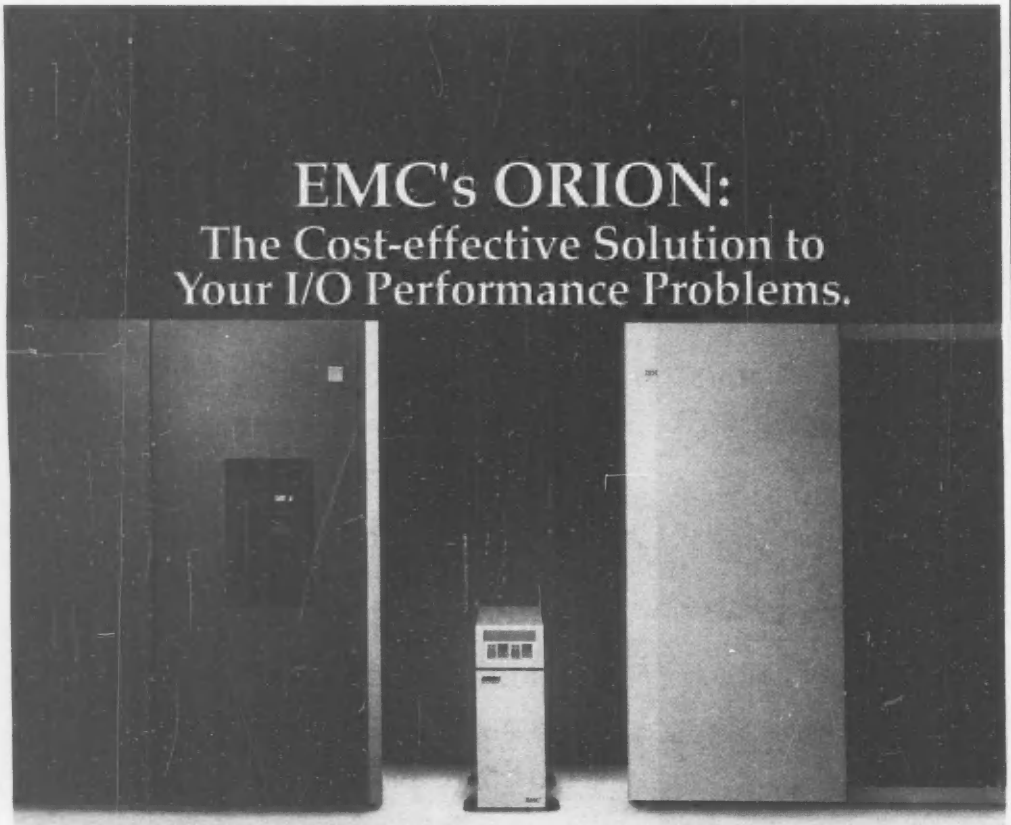
Data Translation
100 Locke Drive
Marlboro, Mass. 01752
508-481-3700

A software development tool for Apple Computer, Inc. Macintosh users has been introduced by Abraxas Software, Inc.

Called Codecheck, the product was designed for C programmers and reportedly analyzes the code for portability, maintainability and style. The software utilizes expert system techniques for rule-based source-code analysis, according to the vendor.

Codecheck supports all C compilers from major vendors and requires a minimum of 512K bytes of memory. It is priced at $295, and discounts are available for multiple copies or educational purchases.

Abraxas Software
P.O. Box 19586
Portland, Ore. 97219
503-244-5253



Maximum Performance

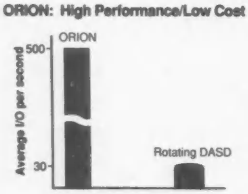
EMC's ORION is the fastest solid state disk subsystem available for your mainframe computer. ORION features a technologically advanced design enabling you to receive unprecedented performance gains.

An integrated 3880 type storage director, in addition to features inherent in solid state technology, gives ORION an access time of 0.1 millisecond — a performance milestone.

What's more, EMC protects your investment by making ORION compatible with all IBM 370 and IBM PCM computers. Therefore, performance boosts are realized well into the future, when CPU upgrades become necessary.

EMC's ORION — the I/O solution you have been waiting for to maximize your system's performance and productivity.

ORION: High Performance/Low Cost



Minimum Price

EMC's ORION Solid State Disk Subsystem is the lowest cost solid state solution to your I/O performance problems. Its state-of-the-art design gives you a substantial return on your investment for years to come.

ORION's small footprint and low power requirements eliminate costly computer room renovations. Ease of installation and low cost of ownership make ORION an expedient and economical solution to your I/O performance problems.

EMC's ORION — the most economical performance boost for your current and future mainframe systems.

EMC²
The System Enhancement Company.

IBM is a registered trademark of International Business Machines Corp.

For more information, call:
1-800-222-EMC2
In Mass., call (508) 435-1000

Copyright 1988 EMC Corporation

DATA STREAM

Jeffrey Kaplan

LANs meet Mr. Fix-It

The recent flurry of activity among the top two local-area networking companies has turned up the spotlight on service and support issues.

3Com recently announced a major service agreement with Hewlett-Packard as part of a joint product development and marketing effort that also nets HP a 5% equity position in 3Com. Novell responded with support arrangements for four major service providers, including HP, as well as software-licensing agreements with an assortment of systems and software vendors.

Numerous customer-driven forces are pushing many vendors to seek cooperative agreements with these and other LAN companies.

The fundamental reason for this series of events is clear: LANs have gained acceptance within the customer base, and

Continued on page 55

Net encounters snags

Bellcore prototype gains interest, not progress

BY ELISABETH HORWITT
CW STAFF

MIDDLETOWN TOWNSHIP, N.J. — Hoping to help its owners, the regional carriers, effectively deliver multimedia networking services to user workstations, Bellcore has been working on a network prototype that is said to send text, graphics, audio and live video to an X Window System-compatible workstation.

But while several vendors have expressed interest in the prototype, Bellcore has run into resistance in getting firm specifications implemented in commercial products. The major barrier — proprietary offerings that are already beginning to appear.

User interest in interactive, multimedia communications has grown in tandem with emerging Integrated Services Digital Network (ISDN) services, which allow voice, data and video to be transmitted over the same digital pipeline.

For example, in the multisponsor Trivista series of studies to evaluate potential ISDN applications at specific user sites, AT&T Network Systems found one hotel chain that was interested in having customers check in at the airport through a workstation that provides data, video and voice interaction.

Broadband ISDN, a still-embryonic standard that would support between 45M and 100M bit/sec., would probably be the necessary delivery vehicle for such services, according to Bellcore. Currently available ISDN specifications only support speeds of up to 1.5M bit/sec., which would be inadequate for simultaneous delivery of multiple media — particularly if full-motion video were included, a company spokesman said.

As co-owners of Bellcore, the seven regional Bell holding companies count on "projects like this one [to] help us understand what we have to put on the pub-

Continued on page 56

Bellcore researcher *accesses windows through net prototype*

Three 'bears' help link trading firm

ON SITE

BY JULIE PITTA
CW STAFF

NEW YORK — The complexity of the financial services industry — the processing demands of traders, the diversity of systems and the need for worldwide communications — is a challenge that Bear Stearns & Co. is trying to meet through the use of three customized networks.

These networks — Bearlan, Bearman and Bearwan — link the Manhattan offices of the Wall Street financial services firm to users spanning the globe from London to Tokyo.

"Bearwan was the first digital hoot-and-holler network on Wall Street," said Jeff Marshall, Bear Stearns' communications director. "Anyone can talk and receive at the same time." Bearwan was purchased from Telaids Corp., and DS3 and T1 connectors provide access from Bearman to Bearwan.

According to Marshall, users at the New York headquarters are linked together via the Bearlan local-area network.

"Imagine a very large building with two very large trading floors that are very trader-dense," Marshall said. "We have distance problems." The trading floor measures more than 700,000 square feet.

A veritable hodgepodge

Adding to the complexity of the network, there are 10,000 desktop systems within Bear Stearns. For example, there are 500 traders at the Park Avenue office who use a mix of systems that include IBM Personal Computers and compatibles, Apple Computer, Inc. Macintoshes and any one of a variety of workstations from Sun Microsystems, Inc., according to Bush Karbal, an associate director at the firm. Still others have opted to use Quotron Corp. terminals running stock quotes from various exchanges.

The system used is determined by the trader and approved by his manager. "Everything in the company is based on profit and loss," Karbal explained. "If a trader can make money using a particular system,

Continued on page 55

Service opportunities

User plans for enlisting outside support show that the greatest growth is in data communications and LANs

	Voice	Data	WANs	LANs
Respondents who will use more outside support	27%	40%	25%	40%
Those planning to use less	17%	16%	18%	10%
Net new opportunities	10%	24%	7%	30%

SOURCE: THE LEDGEWAY GROUP, INC.
CW CHART: JOHN YORK

Inside

- Flexlink aims to link via various net standards. Page 54.
- Network General's Sniffer covers all OSI bases. Page 54.
- Enable Software everywhere except standing still. Page 55.

The NEW JAMES MARTIN WORLD SEMINAR

"Four Days That Will Dramatically Change Your Approach to I.S."

JAMES MARTIN is the world's foremost expert on the productivity of information systems technology. His 4-day seminars are where top management and MIS professionals learn how to defeat the applications backlog and change the competitive position of their enterprise.

JAMES MARTIN's compelling vision of the future is presented brilliantly in his upcoming seminar series, and is offered exclusively in North America by Technology Transfer Institute:

To register, or receive a FREE 16-page brochure,

Call Today . . . (213) 394-8305 ext. 27

Washington, D.C.
May 8–11

Boston
June 12–15

San Francisco
June 19–22

Technology Transfer Institute
741 Tenth Street, Santa Monica, CA 90402-2899

Look where McDonnell Douglas is

You may know us as an aerospace company, but you'd be surprised at how many different ways McDonnell Douglas information solutions are relied on all over the world, and just down the block. For information, call 1-800-325-1551.

today.

1 UNIGRAPHICS,® our world-class CAD/CAM/CAE system, helped design and manufacture many components of the new car that will carry the couple off to their honeymoon.

2 The future looks bright for the bridesmaid too. Her Big Ten MIS curriculum included system development using our premier CASE tool, ProKit* WORKBENCH.®

3 TeleCheck® is our nationwide check approval system that enabled Aunt Sue, Uncle Charlie and Cousin Sara to walk out of three separate stores with the same toaster oven.

4 Our PERMAC2 maintenance management system helped produce the brand name appliance that enables the happy couple to have their cake and eat it too.

5 No wedding is complete without a few nuts, so when customers call one of the world's largest almond manufacturers, a McDonnell Douglas computer handles it —from initial order to shipping to invoicing.

6 We provide TYMNET,® a value added network, to help graphic arts dealers stock the supplies the photographer needs to make the moment last.

MCDONNELL DOUGLAS

A company of leaders.

OSI migration spurs latest Sniffer version

BY PATRICIA KEEFE
CW STAFF

MOUNTAIN VIEW, Calif. — With an eye toward migration to Open Systems Interconnect (OSI)-based networking, Network General Corp. recently introduced a version of its protocol analyzer said to support the full seven-layer OSI protocol stack.

The Sniffer Version 2.1 reportedly can be used to optimize performance on local-area networks running International Standards Organization (ISO) protocol software, such as those conforming to Government OSI Profile or Technical and Office Protocol 3.0.

It also provides enhanced security features designed to identify network intruders. Users can now identify any traffic to and from unknown or unauthorized stations, the vendor said.

Network General is initially targeting developers of ISO-based communications products, but company founder Harry Saal expects user interest in the product to pick up once OSI products really begin to hit commercial sites, which is expected to occur during the next two years. "The success of Transmission Control Protocol/Internet Protocol has hindered the growth of OSI in the U.S.," Saal said, adding that the recent wave of TCP/IP product introductions has passed.

The latest version of the Sniffer is the first LAN analysis tool that allows network developers and users to examine and debug networks using high-level OSI protocols, including CCITT X.400 electronic mail and FTAM.

It uses expert system-like technology to benchmark products that technically conform to OSI standards but that may still provide widely varying performance levels.

"With OSI, you can still screw up with an inefficient system and still pass all the conformance tests," Saal said. "The range from best to worst [in this class of products] is just incredible," he added, claiming such a range in quality in standards-based products was not the case in the past.

Using intuitive menus, Version 2.1 translates OSI protocols into information displays that use simple English, graphs and protocol-layer coding to enable users to identify compatibility and performance problems.

In addition, Version 2.1 allows users working with ASCII output files to store captured information in formats readable by popular spreadsheet programs. This enables LAN administrators to track network activity for future analysis.

Version 2.1 incorporates OSI protocol support via the Sniffer PA-1306 ISO Protocol Suite, which costs $1,995. The PA-1304 TCP/IP Protocol Suite costs $995. Both products are available for all three Sniffer product lines, ranging in price from $15,750 to $24,000.

Flexlink packs proprietary bags

BY ELISABETH HORWITT
CW STAFF

RENTON, Wash. — Flexlink International Corp. plans to supplement its proprietary multivendor links with connections based on the Open Systems Interconnect (OSI) networking standard as well as to Digital Equipment Corp.'s Decnet, the company announced.

Future support will include LU6.2, Transmission Control Protocol/Internet Protocol (TCP/IP) and IBM's Common Programming Interface for Communications (CPIC), according to Gregory Brown, Flexlink's director of technical marketing.

Flexlink currently provides a family of communications software packages that provide file exchange, full-view terminal access, tape-archive backup and electronic mail between IBM, DEC and Sun Microsystems, Inc.

The company's goal is to provide these capabilities across a wide variety of networking environments. "If you have a very complex environment with SNA, OSI and TCP/IP and want to write an application that can be ported on top [of those three networking systems], we have the solution," Brown said.

Flexlink plans to offer its application interface to other vendors and to users who may want to port applications among the different systems supported, Brown said. The OSI implementation will allow users to access all three systems over either a CCITT 802.3 Ethernet or 802.5 Token-Ring network, the company said.

The implementation makes use of Intel Corp.'s Fastpath/OSI platform for IBM and DEC processors and Sun's Sunlink OSI platform for Sun workstations.

Porting plans

The vendor plans to port Flexlink to IBM and DEC OSI application interfaces such as CPIC as soon as they become available, Brown said.

Flexlink offers a local channel-to-bus connection based on Intel's Fastpath, "which is very fast but proprietary," Brown said. The company plans to continue supporting this but also to support OSI-based connections. This is because "our customers have told us they want a network protocol that they can trust into the future," Brown said.

"I think people's hesitancy to go with OSI now has been due to lack of product availability; few people say OSI will never happen."

Flexlink applications provide users with the same familiar commands for accessing functions on the newly supported network protocols, Brown said.

Decnet support is scheduled to be available in the second quarter. OSI support between IBM and DEC is scheduled for third-quarter availability, and Sun OSI support is slated for the fourth quarter.

Pricing was unavailable at press time.

Flexlink also announced that its software will now run on 8400 Superband Model DI, a communications system introduced last week by Computer Communications, Inc. that is said to provide remote T1 channel-based links beteen IBM, DEC and Sun computers.

BIT BLAST

Systems integration a hot market

Systems integration is heating up in the commercial sector, according to a recent report from **The Ledgeway Group** in Lexington, Mass. The consulting firm predicted that systems integration projects for commercial firms will grow from $1.6 billion at year-end 1988 to $3.8 billion in 1992.

Logica Technology Systems, Inc., a subsidiary of **Logica Data Architects, Inc.**, will develop an X.400 product for **Tandem Computers, Inc.** Based on Logica's CPLEX.400, the product will be marketed by Tandem to accounts that require message processing in a multivendor environment. Product availability was not disclosed.

Infotron Systems Corp. has launched the LAN Systems Division, which will develop and market local-area network products. It replaces the company's Itron Division, which marketed low-end multiplexers and LAN equipment. The Cherry Hill, N.J., T1 multiplexer vendor recently announced a LAN server and LAN-to-LAN bridge, but it wants to target the burgeoning LAN market in a more focused fashion, a spokesman said.

The 1989 edition of **"The World Telecommunications Tariff Directory"** (WTTD) is available from **Lynx Technologies, Inc.** in Little Falls, N.J. The 10-volume, 5,000-page resource guide lists telecommunications carriers, Postal Telephone and Telegraph authorities and related services from more than 200 countries. Included are tariffs for domestic and international telephone, telex, private leased circuits and public data networks. Call WTTD Editor Kathleen Elsayed at 201-256-7200 for information.

Foster City, Calif.-based **ASA/Micro-MRP** is offering an electronic data interchange (EDI) module for microcomputer-based manufacturing automation systems. ASA's EDI module reportedly will contain the predefined EDI standards for each industry. It is targeted at small manufacturers that need to retain or solicit business with larger companies, many of which require EDI transactions.

The first international interoperability tests for the **Open Systems Interconnect X.500 Directory Services** standard are taking place at the CeBIT '89 trade show, which ends Wednesday in Hannover, West Germany. X.500 provides a directory database of all devices or users on a network.

Digital Equipment Corp. said it implemented its first U.S. X.400 connection with a public electronic mail carrier — **MCI Communications Corp.** The link allows DEC employees to exchange industry-standard E-mail with Compuserve and MCI Mail subscribers as well as other X.400-based systems through MCI Mail XChange 400.

"We like the Codex 2382 high-speed modem for its brains, its brawn and its underdeveloped price."

See us on page 57

Enable incorporates Higgins E-mail unit

BY PATRICIA KEEFE
CW STAFF

Change seems to be the only thing on the agenda these days at Enable Software, a supplier of network-based integrated office systems software to mostly government accounts.

Not only did the applications developer recently change its name from The Software Group, but it also snapped up Conetic Systems, Inc., which markets the Higgins electronic mail and groupware application.

For legal purposes, Enable actually purchased the assets of Conetic for an undisclosed sum. Conetic President Howard Case will stay on to lead the Higgins division.

"It behooved us to merge with a parent company that understood the systems software market," Case said, noting that software heavyweights Microsoft Corp. and Wordperfect Corp. are readying their own personal computer E-mail offerings for introduction.

Even more critical, he said, was the fact that the price of stand-alone E-mail has eroded to "a few pennies per user."

Watching the horizon

While Conetics warily watched the horizon, Enable, in an effort to further extend its penetration into the office, was looking hard at E-mail services.

Higgins' messaging capabilities will be folded into Enable/OA, which integrates such different functions as spreadsheets, word processing, database and telecommunications. The merged product has already been offered in response to several government bids.

Today, Enable is specified in a a number of government contracts, including a 90,000-unit U.S. Department of Defense contract. As for Higgins, it won a recent 8,000-unit office automation contract for the U.S. courts.

Three bears

FROM PAGE 51

he does. His compensation is based on how much he pulls in."

Bear Stearns copes with its broad range of desktop machines in the headquarters office by standardizing on workstations running various forms of Unix because of its multitasking capabilities. "It allows them to call up data from several different feeds at one time, which you can't do on an MS-DOS machine," Karbal said.

> "BEARWAN WAS the first digital hoot-and-holler network on Wall Street."
>
> JEFF MARSHALL
> BEAR STEARNS

Bearlan, which is used in the New York offices, links all the Unix workstations within the building using a 10M bit/sec. Ethernet network that consists of Synoptics Communications, Inc.'s Lattisnet and Novell, Inc.'s Netware communications software.

Thirty backbones make up Bearlan and are used to segment traffic, applications and user groups. The backbones run over a mix of fiber and shielded and unshielded twisted-pair and are linked together using Sun workstations as gateways as well as Digital Equipment Corp. LAN bridges.

Bearman, a metropolitan-area network, links users at the firm's three Manhattan offices. Bearman is a voice/data network with about .5G bits of transmission capacity, Marshall said. It is a fiber-optic network comprising DS3 and T1 connectors using equipment from Teleport Communications, Inc. "It's a very dense, high-bandwidth network," he said.

The firm's auditing activities, books and records are handled at two other New York facilities tied to the Park Avenue headquarters through the metropolitan-area network. All three sites are connected mostly to access electronic mail. "There's not a lot of [other] data that needs to be exchanged between various groups," Karbal said.

Bearwan is a 15M-bit to 20M-bit wide-area network connecting the firm worldwide, including its data center in New Jersey.

The data center houses two IBM 3090 and 4381 host systems and eight Digital Equipment Corp. 8000 series minicomputers, half running VMS and the other half running Ultrix, DEC's version of Unix.

Two IBM System/36s and three Wang Laboratories, Inc. VS300s round out the center's systems inventory. The host systems house the vast amount of financial data that is needed to keep the firm in operation, including customer accounts, Karbal said.

Kaplan

FROM PAGE 51

demand has skyrocketed. Every market research firm is reporting record LAN shipments and projecting spiraling growth in the number of network installations during the next five years; some projections have topped 300% annual growth.

Despite this astounding increase, LAN vendors hardly have the time to savor their success. They are barely able to produce enough hardware and software to keep up with the backlog of orders. Delivering LAN systems entails more than just boxing the product and sending it to the customer. Customers need help installing and supporting their LANs as well — an area that has been poorly served by many LAN vendors.

The Ledgeway Group surveyed more than 600 Fortune 1,000 companies, government agencies and educational institutions in 1988. In that survey, we asked MIS and communications managers to identify the network environments in which they will need the greatest outside help during the next two years.

When given a choice between voice and data communications as well as local-area and wide-area network (WAN) environments, customers identified data communications overall and LANs in particular as their areas of greatest interest (see chart page 51). Beyond the obvious overlap, these issues are increasingly important because the transmission of information has become critical to the operations of many organizations.

As LANs gain acceptance at higher levels of the customer's organization, the need for additional value-added services is going to grow. Corporate priorities now go beyond simple, traditional fix-it solutions of maintenance and repair. Network integration between departmental LANs has triggered a growing support need, particularly among customers with LANs that evolved without a corporatewide or enterprisewide plan — a widespread phenomenon.

LAN/WAN byproducts

Senior management has also become concerned about LAN/WAN integration as a byproduct of attempts to build a transparent transmission facility for information flow.

The bottom line, then, is that network design, planning, integration, monitoring and optimization are in greater demand today because of customers' growing operating pressures.

Another factor igniting user concern is the embryonic nature of the LAN industry. Voice and WAN systems are more mature, offer greater reliability and possess network management and control capabilities that can be administered by the customer. Not only are LANs not as far along in the product development cycle, but customers are also not as far along on the LAN learning curve.

Most LANs today lack the self-service capabilities typically found in voice and WAN networks. As a result, customers are forced to rely more heavily on their vendors for implementing and administering their LANs. Until fairly recently, this has translated into service contracts with local resellers or consultants — a less than satisfactory solution for many users.

The ability of LAN vendors to support their customers has thus become pivotal. It is a key selection criterion for many customers.

As the bells and whistles offered by competing LAN systems become comparable and adherence to international standards gains acceptance, technical differentiation is diminishing. Increasingly, the quality of a vendor's service and support has become an important attribute — both for the user and for the supplier.

Numerous customer surveys have revealed that if a vendor fails to satisfy a customer's remedial service and support needs — for instance, problem diagnosis and resolution — then the customer will not consider the vendor for follow-on product purchases or additional value-added consulting services.

Needless to say, if 3Com, Novell or any other LAN supplier stumbles in its efforts to address demands for basic service and support, it risks losing ground in the race for customer loyalty and big accounts.

To offset this risk, strategic partners have become a critical element of LAN vendors' efforts. Major systems vendors have entered the fray in an effort to solve their customers' networking needs. More announcements are sure to follow the LAN support arena. Look for this trend to continue in tandem with the increasing complexity of customers' networks.

Kaplan is director of network and professional services at The Ledgeway Group, Inc., a consulting firm in Lexington, Mass.

"The demand for Codex's 19.2 kbps modem is growing fast. So you'll be glad to know you can order through us and get immediate delivery."

See us on page 57

Bellcore

FROM PAGE 51

lic switched network to allow multimedia exchange," said Southwestern Bell Corp. district manager of technical planning Jim Graham.

"We do need to standardize the equipment interface and what we have to do at the transport level to get different media information concurrently arriving for the user," he added. Customers are unlikely to make use of multimedia networking if they have to set up a separate call for each type of transmission, Graham said.

Bellcore's Integrated Media Architecture Laboratory, located here, has been exploring how such services can interface with X Window because it is a user-interface standard that is widely supported by workstation vendors, Graham said.

Companies such as Sun Microsystems, Inc., Hewlett-Packard Co. and Apple Computer, Inc. have expressed interest in the prototype network, according to Bellcore. However, the local carriers' research and development arm has no way of mandating or even persuading workstation vendors to interface with its networking protocols, Graham said.

The divestiture decree prohibits Bellcore from developing or providing other vendors with networking equipment specifications and bans the former Bell operating companies (BOCs) from producing or selling networking equipment.

In the meantime, companies such as Apple are developing multimedia "groupware," or computer products, "to assist collaborative work rather than just individual products," according to Michael Liedhold, manager of hypermedia research at Apple's Advanced Technology Group.

Apple, Xerox Corp., Ashton-Tate Corp., Lotus Development Corp. and others are tackling groupware from a variety of angles, Liedhold indicated. For example, Apple Chief Executive Officer John Sculley recently demonstrated a product by AST Research, Inc. that allows video to be called up on a Macintosh window. Furthermore, Apple has created Hypercard, which allows the user to point and click on interactive video.

Liedhold's group viewed and was favorably impressed by Bellcore's prototype network — but only as one possible technology among many, Liedhold said. Bellcore has "shown how broadband fiber-optic networks can be used in a collaborative effort, but it is purely speculative. No one has switched fiber networks right now," he added. When asked if Apple plans to support Bellcore's specifications as a way of allowing its workstations to access future BOC services, Liedhold said, "We have cordial relationships with the telcos and have announced that we are interested in all aspects of connectivity," including broadband ISDN.

Even while they are funding Bellcore's venture into multimedia networking technology, the BOCs are going ahead with largely proprietary multimedia plans. For example, Southwestern Bell recently teamed up with Sammons Communications Inc., a Dallas-based cable television company, to test simultaneous voice and cable TV signals over fiber-optic links to the home.

NEW PRODUCTS

Local-area networking hardware

Samsung Information Systems has announced its SE2100 Ethernet Interface card, a product developed primarily for Novell, Inc.'s Netware users, the company said.

The card reportedly offers a 16-bit-wide shared memory interface with the host personal computer and 16K bytes of random-access memory for packet buffering. Scheduled for delivery in April, the product is priced at $499 and includes software drivers to support all versions of Netware 2.0a and above.

Samsung Information Systems
77 Tasman Drive
San Jose, Calif. 95134
408-434-5400

Two fiber-optic Arcnet controller boards developed for IBM and compatible personal computers have been unveiled by Network Innovations Corp.

The Pcarc/F1 board reportedly operates point-to-point at distances up to 4,000 feet over a single 200-micron fiber. It is priced at $895.

The Pcarc/F2 operates at distances as great as 11,500 feet over 50/125, 62.5/125 or 100/140 type dual-fiber cable, the vendor said. The board costs $975.

Both products use SDMA 905 connectors.

Network Innovations
7909 Bond
Lenexa, Kan. 66214
913-894-2277

Two 20-MHz workstations for IBM-compatible local-area networks have been unveiled by Racore Computer Products, Inc.

The SL-80 and SLE-80 Lanstations are based on an Intel Corp. 80286 chip, the vendor said, and come standard with 512K bytes of random-access memory on the motherboard. The SL-80 is reported to be a diskless workstation that provides two full-length AT-compatible 8/16-bit expansion slots. It is priced from $1,779.

The SLE-80, designed for systems administrators, supports a single disk drive or other peripheral device and is priced at $1,979.

Both products carry a one-year warranty.

Racore
170 Knowles Drive
Los Gatos, Calif. 95030
408-374-8290

Network management

Digital Communications Associates, Inc. has announced a joint software development effort with Quintessential Solutions, Inc.

The companies are reportedly developing a software program for DCA's Open Network Management System (ONMS) that will enable users to plan and manage the growth of wide-area networks.

Dubbed the Network Resource Planning Tool (NRP), the product is scheduled to be available in the spring.

The basic NRP module will be priced at $15,000.

DCA
1000 Alderman Drive
Alpharetta, Ga. 30201
404-442-4000

Racore's *Lanstation SL series*

Cubix Corp. has introduced two AT bus-based multiprocessor boards for the Novell, Inc. and other network environments.

Scheduled for delivery this month, the QL 1001 and QL 1002 intelligent processor boards can be used as personal computer workstations, dedicated asynchronous servers, batch servers, print servers or electronic mail servers, according to the vendor.

The QL 1001 half-slot board incorporates an 8-MHz PC processor and 768K bytes of random-access memory. It is priced at $645. The two-user QL 1002 reportedly features two 8-MHz PC-compatible processors and 768K bytes of RAM and is priced at $1,145.

Cubix
2800 Lockheed Way
Carson City, Nev. 89706
800-648-2130

"We choose Codex's 19.2 kbps modem because they offer prompt on-site service: the best network insurance of all."

See us on page 57

Screen Painting and Conversation Prototyping for CICS and IMS/DC

Quick Screen 3270, a new and easy to use PC based tool, will help you develop screens and demo systems in minutes instead of hours!

Quick Screen 3270 features include:

- fast WYSIWYG map entry (text and attributes) from 1 screen
- advanced, powerful word processing and SPF type editing dynamically integrated with variable screen flow prototyping
- generate/import BMS and MFS (COBOL copy member for MFS)
- 5 windows provide for multiple prototyping and edit sessions
- over 120 function sensitive help and pop-up screens
- ideal for analysts - no programming experience required for use

Compare it to SDF2 or to whatever you use today. Call or write for a

FREE Guide or FREE 60 Day Trial !

Integrated Systems Technology, Inc.
5 Chapel Hill Road, Short Hills, NJ 07078, (201) 376-3722

Customer-premises equipment

Infortext Systems, Inc. has introduced the Traffix PBX Optimization System.

Designed specifically for telecom managers, the product reportedly analyzes trunk services and calculates the actual savings from reconfiguring trunk usage, including WATS and other special services. The system can operate in either IBM/Rolm or Northern Telecom, Inc. SL-1 environments and is priced from $5,000 to $40,000, depending on application.

Infortext
1067 E. State Pkwy.
Schaumburg, Ill. 60173
800-323-6550

AT&T has unveiled the 7000 series line of voice terminals, developed for its Definity product family.

The 7500 series of Integrated Services Digital Network voice terminals are available in three configurations designed to accommodate a 10- to 31-line appearance.

All versions include built-in speakerphones and headset adapters and are priced from $450 to $880. Shipments are scheduled for the fourth quarter.

The 7400 series of Digital DCP terminals are also offered in three configurations — a 10-line appearance model, a 34-call appearance unit and an analog single-line telephone. Pricing ranges from $75 to $500.

AT&T
National Product Center
1 Speedwell Ave.
Morristown, N.J. 07960
800-247-1212

Links

Dove Computer Corp. has announced two Fastnet Ethernet connectivity products for the Apple Computer, Inc. Macintosh marketplace.

The Fastnet SE/30 is reportedly an Ethernet adapter designed for the Macintosh SE/30 computer. According to the vendor, the product accommodates numerous protocols and provides support for all types of full-function networking applications. The adapter is priced at $599.

The Fastnet SE Ethernet adapter was developed for the original Macintosh SE machine and offers the same functions as the Fastnet SE/30, the company said. It is also priced at $599.

Dove Computer
1200 N. 23rd St.
Wilmington, N.C. 28405
800-622-7627

A product that gives facsimile machine capabilities to IBM Personal Computers and compatible systems is now available from Delta Tech, Inc.

According to the company, Profax is an easily installed option that enables computer users to send and receive facsimile messages at a 9.6K bit/sec. transmission rate.

Features reportedly include broadcast transmission and unattended sending and receiving functions. The product is priced at $498.

Delta Tech
Suite 801
1111 Jefferson Davis Highway
Arlington, Va. 22202
703-486-2660

Modems/Multiplexers

Coastcom has announced a modular T1 multiplexer/data service unit, developed to provide additional flexibility when configuring T1 transmission facilities.

Called the Coastcom T1M III, the device is said to be fully programmable and can be remotely configured by using software. The unit can connect up to eight synchronous or asynchronous data channels to a 1.5M bit/sec. T1 facility. It is available in both 19- and 23-in. rackmount versions and is priced at $3,900.

Coastcom
2312 Stanwell Drive
Concord, Calif. 94520
415-825-7500

Cabling

Belden Wire and Cable has unveiled a Token-Ring local-area network office cable that has reportedly been verified by an IBM-approved Electronic Testing Laboratory for IBM Type 6 Cabling System Specifications.

The 1215A is recommended for office patch panel and jumper cable applications, the vendor said. The two-pair cable features four copper conductors and is available in 500-, 1,000- and 1,640-foot put-ups. Pricing is $316.50 per 1,000 feet.

Belden Wire and Cable
P.O. Box 1980
Richmond, Ind. 43735
800-235-3364

Electronic data interchange

EDI, Inc. has announced Telink Tandem, an electronic data interchange translation software package designed for Tandem Computer, Inc. mainframes.

The modular product is reported to be co-resident on the Tandem CLX, VLX and EXT platforms. Features include multinodal, multiprocessing and multitasking capabilities. The software costs $30,000, including 15 transaction sets. The maintenance fee is $4,000.

EDI
19650 Club House Road
Gaithersburg, Md. 20879
301-670-0811

This message is brought to you by all the Codex Authorized Distributors who can't seem to say enough about the product they sell.

Want to hear more about the most talked about 19.2 kbps modem? Contact your nearest Codex Authorized Distributor for more information about the Codex 2382, and learn how attractive high speed can be.

Alabama
Birmingham
Mid-South Industries
(205) 942-2453

Alaska
Anchorage
Anchorage Telephone Utility
(907) 564-7000
Transalaska Data
(907) 522-1776

Arizona
Phoenix
Darcomm, Ltd.
(602) 274-2886

California
Calabasas
Tredent Data Systems
(818) 704-9044
Cyprus
A Datacomm Solution
(213) 402-2666
Fountain Valley
Datatech
(714) 557-6014
Roseville
Comlink
(916) 783-8885
San Mateo
USL Data Systems
(415) 572-6708

Colorado
Denver
DSI
(303) 777-8211
Englewood
Internet Datacomm
(303) 799-0902

Georgia
Norcross
RTS Distributors, Ltd.
(404) 449-0411
(800) 241-8707

Illinois
Chicago
Anixter
(800) 826-9708
Naperville
Commercial Resources Corp.
(312) 357-1800

Massachusetts
Bedford
Continental Resources
(800) 343-4688
North Attleboro
C.E. Datacomm, Inc.
(508) 699-2525

Michigan
Grand Rapids
J.B.M. Data Communications
(616) 957-2242
Mt. Clemens
SKJ Corporation
(313) 465-6515

Minnesota
Eden Prairie
Centron DPL Co., Inc.
(612) 829-2800
Spring Park
Applied Communications of Minnesota, Inc.
(612) 471-8558

Missouri
Independence
Information Products, Inc.
(816) 373-9100

New Jersey
Englewood
Datanet, Inc.
(201) 569-2353
Englewood
TDS
(201) 569-4200

New York
Farmingdale
Electro-Rep
(516) 752-0585
Great Neck
Com/Peripherals
(516) 487-0690
Victor
Data Term
(716) 924-4200

North Carolina
Charlotte
Systems Express Corporation
(704) 554-1950

Ohio
Cincinnati
Gateway Communications
(513) 489-2600
Cleveland
Comtel Instruments Company
(216) 442-8080
Cleveland
TEC Communications
(216) 333-5903
Dayton
Digital Controls Corporation
(513) 746-8118

Oregon
Lake Oswego
Rush Drake
(503) 635-1301

Pennsylvania
Elkins Park
Advanced Network Products
(215) 572-0111
Fairview Village
Cana
(215) 630-9040

Puerto Rico
Rio Piedras
Indesales
(809) 751-7589

Texas
Dallas
Flair Data Systems
(214) 956-7282
Interprint
(800) 527-5113
The Woodlands
DataAids
(713) 363-3838

Utah
Salt Lake City
GTE Data Products
(800) 762-7782

Virginia
Chesapeake
Advanced Communications Tech.
(804) 420-6450
Sterling
Data Communications Systems Corp.
(703) 471-6093
Vienna
Comsel Corporation
(703) 734-3880

Washington
Kirkland
Rep-Sac Corporation
(206) 821-8552

Authorized Distributor
codex

"Look, any DSU is going to work for you most of the time.
Most of the time? That's like playing Russian Roulette with your data."

—Marylou Cincinelli, AT&T DSU Product Marketing Manager

"There are plenty of companies out there selling data service units that are almost as good as AT&T provides.

Almost as well built.

Almost as accurate.

Almost as reliable.

But, since when is 'almost' good enough for your company's data networking? AT&T DSUs are specifically designed to work in tandem with AT&T DATAPHONE® Digital Service for a level of

© 1988 AT&T ® Registered Trademark of AT&T

dependability unmatched in the business.

How does that make your life easier? You can control and collect diagnostic information from one central point, and with only one vendor providing your lines and equipment, service problems can be greatly minimized.

You can even have automatic trouble reporting through an AT&T Data Maintenance Operation and Control Center (Data MOCC) to help you monitor your entire system 24 hours a day.

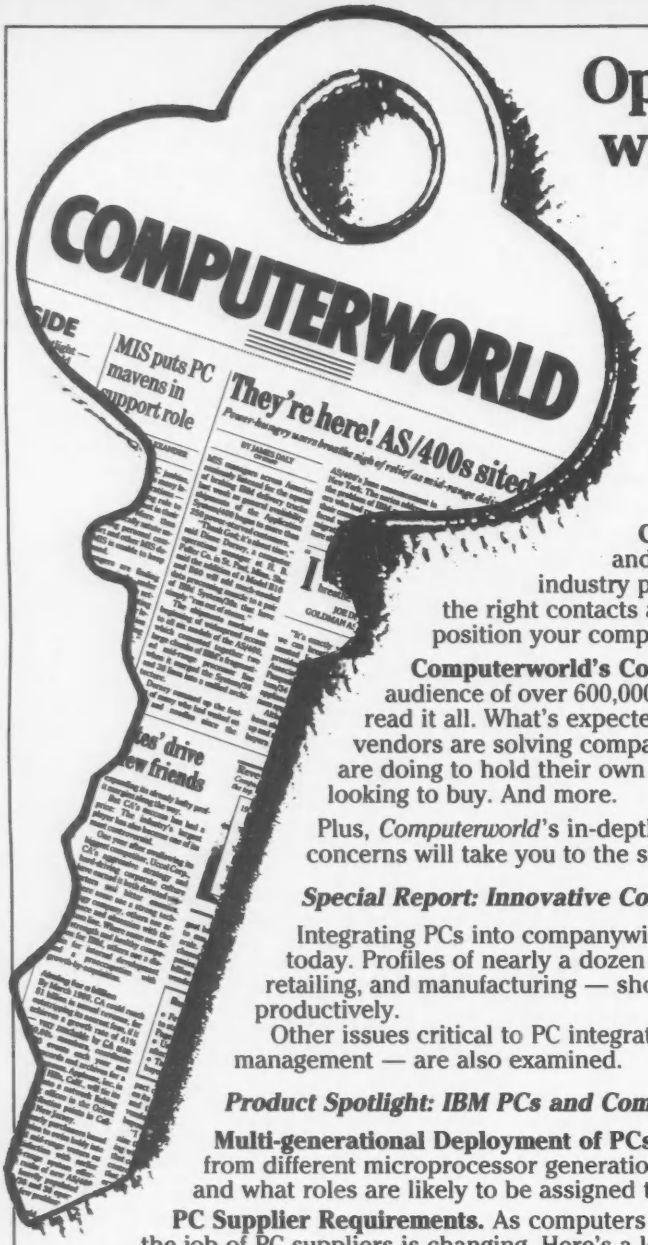
That adds up to increased productivity for all your company's data operations. All because of having the right DSU.

Amazing, isn't it?"

For more information about AT&T DATAPHONE II DSUs, see your AT&T Account Executive, your authorized AT&T Reseller, or call 1 800 247-1212, ext. 719.

AT&T

The right choice.



Open hundreds of doors with just one key.

Computerworld's Comdex Show Issue

Issue: April 10
Color Close: March 24 B/W Close: March 31

Comdex Spring. It's happening in Chicago, April 10-13, and it's one of the biggest marketplaces for computer industry professionals everywhere. It's a powerful place to make the right contacts and get the information you need to competitively position your company or organization. You just need one key.

Computerworld's Comdex Show Issue. On April 10, that's where our audience of over 600,000 — and thousands of influential show attendees — will read it all. What's expected to be announced in the new products arena. How vendors are solving compatibility and connectivity issues. What manufacturers are doing to hold their own as competition heats up. What buyers want — and are looking to buy. And more.

Plus, *Computerworld*'s in-depth coverage of some of the industry's most pressing PC concerns will take you to the show floor — and beyond.

Special Report: Innovative Connections

Integrating PCs into companywide information systems is a must for corporations today. Profiles of nearly a dozen user companies — from vertical markets like banking, retailing, and manufacturing — show how PCs are being connected both innovatively and productively.

Other issues critical to PC integration — downsizing, cost savings, training, and management — are also examined.

Product Spotlight: IBM PCs and Compatibles

Multi-generational Deployment of PCs. More and more, organizations are making use of PCs from different microprocessor generations. The lead article explores how they're doing it — and what roles are likely to be assigned to 80286 and 80386 machines once the 80486 emerges.

PC Supplier Requirements. As computers become more powerful and their uses more critical, the job of PC suppliers is changing. Here's a look at their requirements both today and tomorrow.

Laptop Competition. Two leading laptops go head to head as utility for sales support applications is evaluated.

IBM and IBM Compatible Comparison. A comprehensive chart shows how 80386-based IBM and compatible machines stack up.

As an MIS professional, *Computerworld*'s Comdex Show Issue means opening doors to the latest information on new technologies and products. Understanding of how it all fits into place. Knowing what to expect in the future.

And if you're an advertiser, *Computerworld*'s Comdex Show Issue puts you where you want to be. Among buyers — both at the show with bonus distribution and back at the office. It's your key to opening doors in the buying community. To place your ad, call Val Landi, Senior Vice President/Associate Publisher at (508) 879-0700 or your *Computerworld* sales representative.

COMPUTERWORLD

Sales Offices: Boston (508) 879-0700/**New York** (201) 967-1350/**Atlanta** (404) 394-0758/
Dallas (214) 233-0882/**Chicago** (312) 827-4433/**Los Angeles** (714) 261-1230/**San Francisco** (415) 347-0555

An IDG Communications Publication

See us at Comdex Booth #6506

EXECUTIVE TRACK

Eero Turen has been appointed staff vice-president of corporate information services at **General Binding Corp.** in Northbrook, Ill.

Turen, 39, was most recently director of information systems at General Binding, an international manufacturer of business machines and related supplies. He joined the company in 1975.

Dave Benenati has been promoted to vice-president of technical services/operations at **Blue Cross and Blue Shield of Ohio** in Beachwood, Ohio. Benenati joined the health insurance provider in May 1988 as director of technical services after more than 20 years of IS experience at several Fortune 500 firms.

In his previous position, Benenati successfully completed the first phase of consolidation between two Blue Cross and Blue Shield data centers. Benenati's new responsibilities include continuing that consolidation as well as technical and network support and security administration and control.

Charlotte E. Daniel has been promoted to vice-president of the information management department at **Sovran Financial Corp.** in Bethesda, Md. Others promoted in the department were **Mary Kay Giunta**, assistant vice-president; **Elizabeth A. McKinney**, assistant vice-president; **Keith E. Ross**, systems officer; and **Karen L. Sauls**, systems officer.

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any job changes in Executive Track. When you have news about any staff changes, be sure to drop a note or have your public relations department write to Clinton Wilder, Senior Editor-Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Pacific Bell's modern general

Hancock parlays Army IS experience into civilian systems at telecom giant

BY JEAN S. BOZMAN
and PATRICK WAURZYNIAK
CW STAFF

During a 26-year career in the U.S. Army, Jack Hancock rose to the rank of major general. But his specialty was in information systems — not in armaments. "I was a technology general," Hancock jests.

During his Army days, Hancock helped keep military computers current — and compatible. Now, as vice-president of information systems at Pacific Bell, he has moved his quest for coherent architectures to one of the largest telecommunications companies in the U.S.

Hancock, 57, directs an IS staff of 5,000 and administers a budget of approximately $500 million for Pacific Bell, which is the largest part of the $9.1 billion regional holding company Pacific Telesis Group. His mission, which he decided to accept after retiring twice, is to build a telecommunications infrastructure, Netsys (network and systems), that will last into the year 2010 (see story page 68).

Pacific Bell literally had to talk him into returning to IS full-time, Hancock says, since he had begun to write a book on the history of the Army's information systems.

"I had intended to retire and write a book and travel, but the more Pacific Bell talked to me, the more interesting

Continued on page 68

PROFILE: Jack Hancock

CHRIS SCOTT

Position: *Vice-president of information systems, Pacific Bell*
Mission: *Building a telecommunications infrastructure to support the company's needs for 20 years*

IS execs' attention turns to business issues

BY ALAN J. RYAN
CW STAFF

Human and business issues have outpaced technical concerns for information systems professionals, according to a new Andersen Consulting survey.

The study, called "The Changing Shape of IS," is based on the replies of 120 IS executives from industrial and service organizations in the Fortune 500. The results show that executives are focusing increasingly on the effects technology has on the people, processes and products in their organizations.

Of those surveyed, 76% believe it is more important for them to understand and keep pace with changes in the business than to keep pace with new developments in technology. "This lends credence to the notion of the IS executive as a business generalist first and a technical specialist second," said Melvyn E. Bergstein, managing partner of technical competence at Andersen Consulting in Chicago.

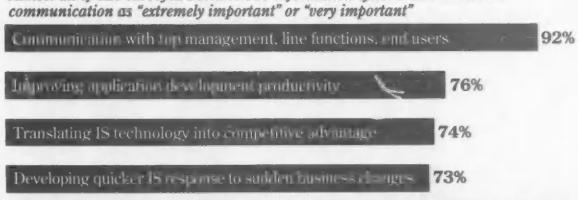
Two-thirds of the respondents cited strategic reasons for taking on most projects. Thirty-four percent of those polled said that business needs — including improving competitiveness in the industry, increasing sales or improving business — justified the importance of current IS projects.

Customer needs, such as timely availability of accurate customer information or updating current systems, were cited by 31% of the respondents as reasons to take on new projects.

Of the projects IS executives tackle, 41% said software development is the most important. On the technical side, 61% of those polled said networking is their chief technical concern; other concerns cited were keeping up with the latest technology (14%) and how to best use available products and services (12%). The study also revealed that IS budgets remain a concern: 35% of the respondents said cost containment to maintain output with budget cuts is the major issue.

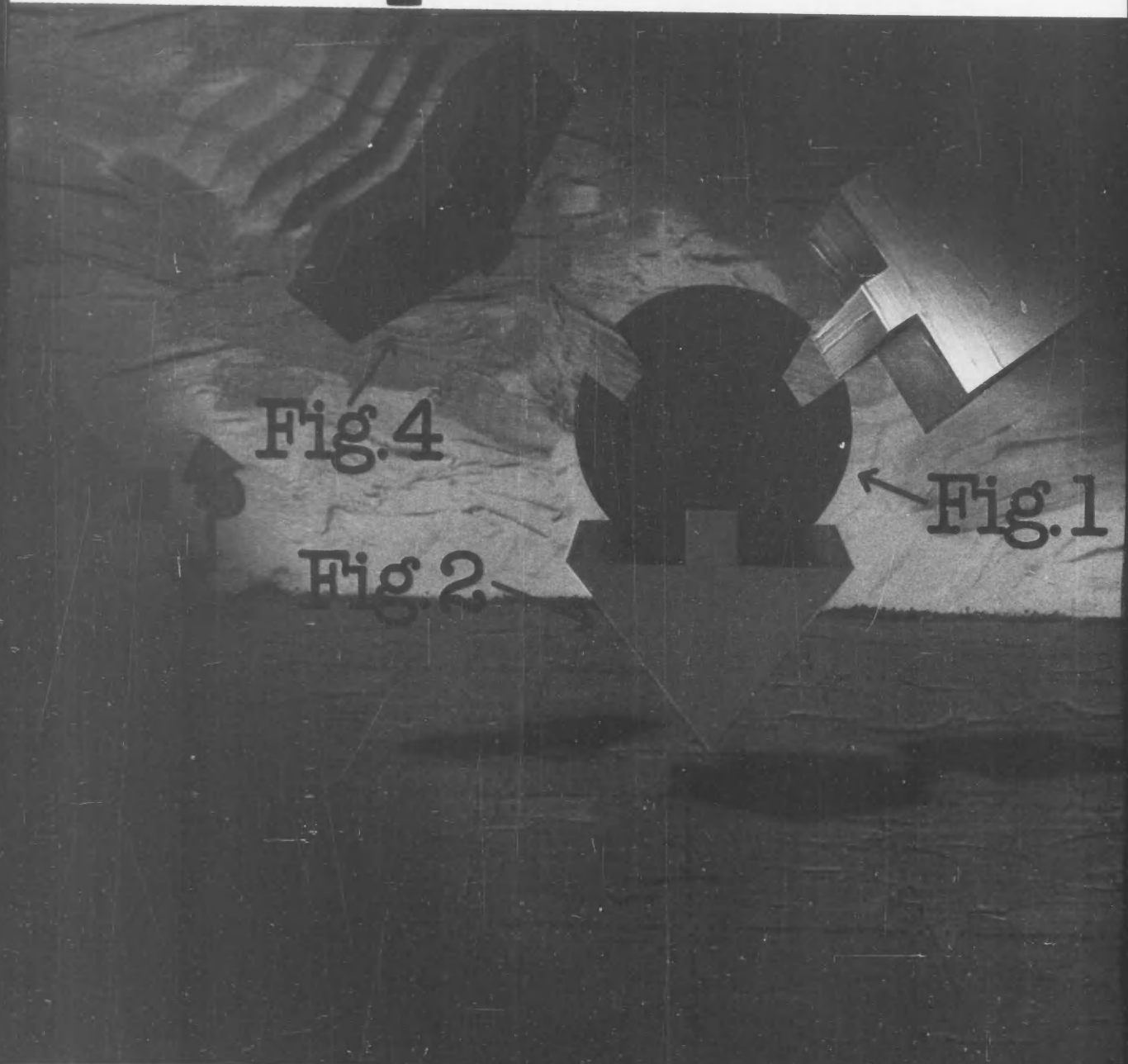
Top IS executive concerns

Almost all of 120 surveyed Fortune 500 information systems executives rate communication as "extremely important" or "very important"



SOURCE: ANDERSEN CONSULTING
CW CHART: FRANK C. O'CONNELL

CompatiBull



KNOW BULL

Copyright © Bull HN Information Systems Inc. 1989

To understand the advantages of compatibility, consider the consequences of incompatibility.

"Someone get me some aspirin."

Now you know why we're such fanatics about compatibility.

We're Bull. A computer company for a business environment that's faster, harder, and more punishing every year. An environment in which traditional ideas no longer work.

To succeed today, you need a different kind of computer company. A new one.

Know Bull.

1-800-543-6699. Phone for a copy of our corporate brochure.

Worldwide
Information
Systems

Bull

Computers will never replace people

BY MICHAEL ALEXANDER
CW STAFF

The purchase of information technology is often accompanied by the promise that automation will make employees more productive, enough so that some jobs can be eliminated.

But computers cannot replace people in any meaningful capacity; they can merely take over some of the work that people do, according to Arno Penzias, vice-president of research at AT&T Bell Laboratories and the winner in 1978 of the Nobel prize in physics.

Contrary to what many information systems executives and management consultants believe, investing heavily in automation will not make it easier for a corporation to thin its middle management ranks, Penzias said during a recent interview.

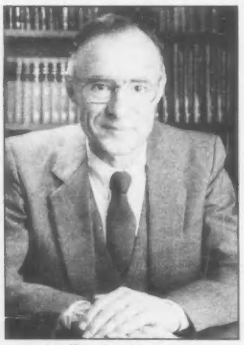
"In the future, we will need more middle managers rather than less," Penzias said, asserting that while automation may reduce the number of low-level workers needed to perform some tasks, it generally demands more work from managers who supervise them.

"Through automation, therefore, I think it's safe to say that the infusion of computer technology into the routine aspects of work expands the role of middle managers," Penzias said.

"In addition, our growing appetite for technology continues to raise the sophistication and specialization of our work force," Penzias noted in his recently published book, *Ideas and Information: Managing in a High-Tech World.*

"As this process continues, I see more managerial effort going into understanding the work of subordinates in order to direct their work," he wrote. "The more knowledge a job demands, the more help and expert supervision it requires."

Technology also makes information more accessible to this growing cadre of middle managers, Penzias said. In companies that come to value information as a competitive weapon, the decision maker's services will become more valuable, he argued.



Bell Labs' Penzias

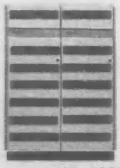
"The main job of middle managers in the future will be to validate information," Penzias said.

Few management consultants buy Penzias' notion that an increased reliance on information technology will lead to an expansion in the ranks of middle management, however. "If it turns out to be true, then we will not have achieved what we are setting out to achieve with information technology," said Jan Duffy, a Toronto-based partner in the information technology practice of the Peat Marwick Consulting Group.

"I am not convinced that the ranks of middle managers will swell," she said. "I feel strongly that if your corporation doesn't streamline and make organizational changes, then you haven't done a good job of technology implementation."

"What is happening is that entire layers of managers are being stripped out," said Victor Janulaitis, chief executive officer at PSR Management Consultants, Inc. in Los Angeles. "People are using PCs to eliminate infrastructure costs, the redundant procedures and controls that are necessary simply because you have layers of management. Businesses operate to generate a profit, and one way they do that is to eliminate overhead and produce a better product."

ANNOUNCING THE SEQUOIA SERIES 300.



The Sequoia Series 300 offers you top performance for your on-line transaction processing (OLTP) application.

New Technology.

The Sequoia Series 300 capitalizes on Motorola 68030 technology to bring you more processing power for your OLTP application. The Series 300 is the newest generation of Sequoia's fault-tolerant multiprocessors, using the Sequoia open architecture to incorporate new technologies and enhance the system's performance. Whether it's an advanced microprocessor like the 68030, a more efficient memory management unit, or enhancements to our OLTP software. Our design philosophy protects your hardware investment.

Superior Performance.

In an industry-standard OLTP benchmark, Sequoia systems outperform the competition in transaction performance. And with Sequoia's tightly-coupled architecture, processing power can be added incrementally while the system is running. The Series 300. A new standard for performance.

A Price Worth Celebrating.

Sequoia Systems maintains a leadership position in price-performance. And with the Series 300, you get even more power without paying a premium. When compared to the competition, Sequoia's systems achieve the lowest cost per transaction available in the OLTP market today based on vendors' published results for equivalently configured systems.

Call 800-562-0011.

More power. Better performance. Fault tolerance. The lowest cost per transaction. Find out how you can join the celebration. Call our toll-free number (in Mass., call 800-245-4033), and we'll send you a full-color eight-page brochure describing the Sequoia Series 300.

Call today. And let the celebration begin.

SEQUOIA

Sequoia Systems, Inc.
3 Metropolitan Corporate Center
Marlborough, Massachusetts 01752
508-480-0800 • FAX 508-480-0184

Copyright © 1989. Sequoia Systems, Inc.
Sequoia is a registered trademark of Sequoia Systems, Inc.

TAKING CHARGE

Alan J. Ryan

Rounding off the square peg

You know your stuff. You're a top-notch information systems professional. To you, it's not that big a deal if everyone knows you and your boss are frequently at odds. All right, *always* at odds.

You didn't have to think twice about starting a lottery in your department to pass along those season tickets to the ballet you got as a job perk. After all, having to get gussied up to watch some dancing and sit next to the chief executive officer's wife is not your idea of a good time.

You think, "So maybe I don't fit in all that well with the corporate culture, but I'm too valuable an asset for them to even think about letting me go." You could be wrong.

Technical talent, job knowledge and advanced degrees certainly add to an employee's appeal, but there are some other subtle skills that employees can cultivate that might help them avoid the ax.

According to Donald H. Sweet, a human resources management consultant at Westwood, Mass.-based Costello & Co., employees should consider and prioritize areas that will probably not be covered in any formal review or job description. Such areas, he says, include understanding the company's total culture.

Sweet says that while most people realize that politics intensify as the employee's importance in the organization increases, what they might not realize are the social and cultural implications of politics.

For instance, an outdoors type who keeps hunting and fishing gear in his truck at all times might be inviting trouble in accepting a position in which season tickets to the symphony and ballet are among the perks.

In his book, *A Manager's Guide to Conducting Terminations: Minimizing Emotional Stress and Legal Risks*, Sweet also says that employees should understand how their value system fits in relation to a job, the company and its philosophy.

"We all have a certain point at which we 'draw the line,' " he says. "Establish this compromise point in advance so you always know where you stand."

One of the best ways to learn a company's culture and unspoken rules is to find a mentor in the organization. While that person cannot save you from the ax, the relationship can provide valuable direction and guidance that is not part of any formal orientation or training within a company, Sweet says.

Employees should also grade themselves, Sweet suggests. Because many appraisal systems do not function as regularly or realistically as they should, employees should not be bashful about asking for the boss' assessment. After all, no one wants to be surprised at review time.

A flaw that many executives have, Sweet says, is assuming they know everything. No matter what your qualifications, it does not hurt to listen to advice. Also, improvement of written and verbal skill should be something all executives strive for.

Finally, he says, have fun and enjoy your job. One of the most powerful tools for success is the ability to take pleasure in your work. The pride that comes from professional achievement is an asset in career advancement because it creates a positive outlook that influences the attitudes of colleagues. If you don't like your job, he says, it is time to look for a new one.

Ryan is a *Computerworld* senior writer.

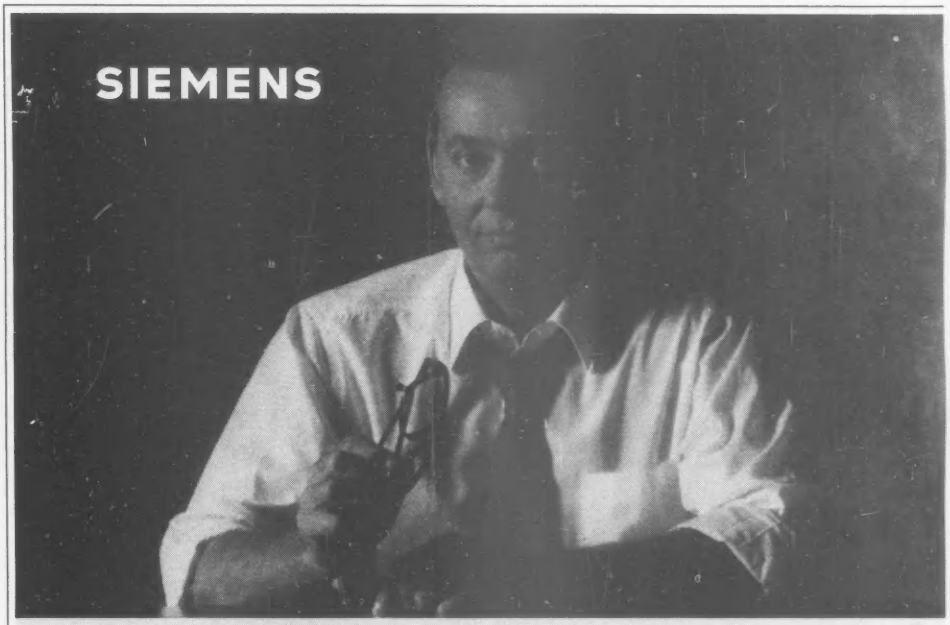
CALENDAR

CHICAGO — The role of corporate MIS managers in the electronic publishing environment is the theme of the upcoming Corporate Electronic Publishing Systems (CEPS) Show and Conference to be held here May 16-18 at McCormick Place.

More than 60 speakers are scheduled to give presentations on a variety of topics that range from desktop publishing to open architecture, according to the show's sponsors.

The conference will be structured around a two-track instructional approach covering how corporate information is assembled, managed, packaged and disseminated, the sponsors said. The first track will be devoted to senior-level corporate executives responsible for MIS, technical document publishing and systems integration. The second track will cover functional issues such as electronic printing and publishing systems, desktop publishing and graphics integration.

CEPS is sponsored by Interconsult, Inc. in Cambridge, Mass., and the Cahners Exposition Group. For any further information about the show and attendance details, contact Goodwill Communications, Suite 914, 1260 21st St., N.W., Washington, D.C. 20036.



"Our policy is 24 hour turnaround on customer claims. Thanks to Siemens high-speed laser printer reliability. . .we're covered."

"Members Insurance Group is a rapidly growing firm that provides property, casualty and life insurance to more than 270,000 policy holders throughout Texas, Oklahoma and New Mexico.

In an industry dominated by Fortune 1000 companies, we've "staked our claim" in the insurance market by providing quality, speed of service, and the clincher. . .a 24 hour issuance program that guarantees 1 day confirmation on every new policy, addition or change.

When we launched our 24 hour program, we knew it couldn't be done with our existing impact printers. The solution was clear. . .laser technology. Unfortunately our choice of another leading vendor resulted in disaster. Downtime disrupted our entire cycle of operations. . .no matter what repairs were made.

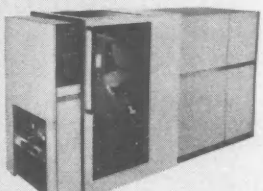
As Vice President of Corporate Information Systems I was charged with resolving the problem. So I turned to Siemens. We installed a Siemens 2300 Model 2 laser printer, and since then. . . we've had uptime all the time.

Today, our Siemens printer produces 1 million feet of output every month. We *never* miss a production window. And best of all, with Siemens advanced features we were able to reduce nightly print time by 3 hours and increase productivity beyond our greatest expectations. That's what I call reliability.

24 hour turnaround? Thanks to the Printer Professionals. . . we're covered."

Jerry Thompson
Vice President
Corporate Information Systems
Members Insurance Group

High-speed laser printing systems



Contact the Printer Professionals at:

Siemens Information Systems, Inc.
Peripheral Systems Division
240 East Palais Road
Anaheim, CA 92805
(714) 991-9700

CC3030-019 WLM 837

EXCELAN ◈ DOS ◈ EXCELAN ◈ UNIX ◈ EXCELAN ◈ VMS ◈ EXCELAN ◈ MAC ◈ EXCELAN ◈ XENIX ◈ EXCELAN ◈ OS/2 ◈ EXCELAN ◈ DOS ◈ EXCELAN ◈ UNIX ◈ EXCELAN ◈ VMS ◈ EXCELAN ◈ MAC ◈ EXCELAN ◈ XENIX ◈ EXCELAN ◈ OS/2 ◈ EXCELAN ◈ DOS ◈ EXCELAN ◈ UNIX ◈ EXCELAN ◈

The brands or product names mentioned are trademarks or registered trademarks of their respective holders.

EXCELAN ◈ XENIX ◈ EXCELAN ◈ OS/2 ◈ EXCELAN ◈ DOS ◈ EXCELAN ◈ UNIX ◈ EXCELAN ◈ VMS ◈ EXCELAN ◈ MAC ◈ EXCELAN ◈ VMS ◈ EXCELAN ◈ MAC ◈ EXC

VMS ◂ EXCELAN ◂ MAC ◂ EXCELAN ◂ XENIX ◂ EXCELAN ◂ OS/2 ◂ EXCELAN ◂ DOS ◂ EXCELAN ◂ UNIX ◂ EXCELAN ◂ VMS ◂ EXCELAN ◂ MAC ◂ EXCELAN ◂ XENIX ▸

◂ EXCELAN ◂ OS/2 ◂ EXCELAN ◂ DOS ◂ EXCELAN ◂ UNIX ◂ EXCELAN ◂ VMS ◂ EXCELAN ◂ MAC ◂ EXCELAN ◂ XENIX ◂ EXCELAN ◂ OS/2 ◂ EXCELAN ◂ DOS ◂ EXCELAN ◂ UNIX ◂ EXCELAN ◂ VMS ◂ EXCELAN ◂ MAC ▸

TOO OFTEN, NETWORKS ARE NOT DESIGNED TO GIVE YOU THE FREEDOM NECESSARY FOR THE FUTURE.

Based on one set of parameters, the connectivity solution you choose today may be right for today. But if you add another factor, future expansion for example, you could be presented with a different picture entirely.

A RESTRICTED CHOICE IS NO CHOICE.

Networks built on proprietary or non-standard protocols severely restrict expandability. Companies that are versed only in connectivity cannot offer a seamless interface with the future. That's why interconnectivity shouldn't be approached in a bolt-on manner. And that's why you need to talk to Excelan. We can successfully provide you a LAN today that allows for your organization's growth now, and well into the future.

PROVEN EXPERIENCE NOT EMPTY PROMISES.

Excelan has been the leader in interconnectivity for seven years, creating sophisticated network systems for Federal and State government organizations as well as a variety of multinational corporations. And having already solved the larger, more complex problems of interconnectivity between disparate systems, we are better placed to solve the relatively simple problems of connectivity between similar systems.

FROM PC TO MAC TO MINI. ON DOS OR VMS OR UNIX.

By taking the wider view now, you can safeguard both your current investment and your future expansion. Excelan can connect PCs to Macs to PS/2s to Sun Workstations to DEC VAXs, even to mainframes. You can run MS/DOS, Mac O/S, OS/2, VMS, UNIX or NetWare. And because Excelan adheres to TCP/IP on the Ethernet standard, and we participate in open systems, there's practically no system we cannot connect to your network in the future.

THE RIGHT BUSINESS DECISION.

So if you're thinking of installing your first local area network, expanding an already existing network, or interconnecting different networks and systems within your company, call Excelan at 1-800-243-8526. Or write to us at 2180 Fortune Drive, San Jose, CA 95131. We'll ensure that the network you buy today will be the network you can continue to live with tomorrow.

◂ EXCELAN ▸

WE NETWORK NETWORKS.

N ◂ XENIX ◂ EXCELAN ◂ OS/2 ◂ EXCELAN ◂ DOS ◂ EXCELAN ◂ UNIX ◂ EXCELAN ◂ VMS ◂ EXCELAN ◂ MAC ◂ EXCELAN ◂ XENIX ◂ EXCELAN ◂ OS/2 ◂ EXCELAN ▸

Netsys goal is seamless simplicity

The goal of Pacific Bell's Netsys architecture, Jack Hancock says, is to make the interfaces between different systems seamless — for exactly the same reasons that factories are striving for computer-integrated manufacturing. This is because the process of ordering, activating and maintaining telephone service, similar to manufacturing, relies on a single view of the underlying data, Hancock says.

Today, the Pacific Bell network is far from that Netsys goal, Hancock admits. Obstacles to the totally compatible network will be many, particularly because there are 54 mainframes in Pacific Bell — predominantly IBM machines and compatibles from Amdahl Corp. Beyond that, there are hundreds of minicomputers dedicated to Pacific Bell maintenance activities, many of them DEC VAXs.

With a downsized IS staff, now hovering at the 5,000 level, and a well-planned budget, Pacific Bell is looking for creative ways to fund Netsys expansion. Hancock has decided that he can save resources by discontinuing the maintenance of aging systems and by retiring obsolete systems.

When systems are needed, Pacific Bell has 2,000 programmer analysts to work on the problem. What they create may, however, be a compromise between today's systems and the Netsys architecture of the year 2010. But that's all right, Hancock says.

"The ultimate goal of Netsys is an ideal, but our network is real-world," he notes. "We have to never let the best be the enemy of the good."

JEAN S. BOZMAN and PATRICK WAURZYNIAK

REALIA SUGGESTS A SIMPLE WAY TO CUT MAINFRAME SOFTWARE DEVELOPMENT COSTS:

USE YOUR PC.

Easier said than done, right? Wrong. Not if you're among the many mainframe programmers who use Realia COBOL, RealCICS and RealDL/I – mainframe-compatible programming tools for the PC. That's because Realia products cut the real costs of the mainframe—not only machine time but also productivity lost to queues, crashes and sluggish response times.

With Realia, programmers gain fast, tight executables and low program memory requirements, as well as control over the testing environment. You can also expect reliable code, unparalleled support, upward-compatible upgrades, and superb utilities for debugging, editing, and file handling.

What more can we offer? How about a *free* 30-day evaluation. Just give us a call.

REALIA®

10 South Riverside Plaza, Chicago, IL 60606, 312/346-0642
34 North End Road, Hammersmith, London W14 0SH, England, 01/602-8066
1284 Wellington Street, Ottawa ONT K1Y 3A9, Canada, 613/725-9212

Pacific Bell

CONTINUED FROM PAGE 61

the prospect of having this job became," Hancock says in his San Ramon, Calif., office in the rolling hills east of San Francisco.

Now that he has the job, the amiable Hancock says he is in no rush to retire. One of his guiding principles helps explain his multiple IS career moves, he says. Rephrasing the credo of an associate at Wells Fargo Bank NA, his last place of employment, he says, "Like a growing plant, people ought to repot themselves every 10 years or so."

Hancock's career in the Army, which began in 1952, paralleled that of the computer industry. Hancock was among only a dozen young officers that the Army sent to universities to learn what they could about the then-infant computer science field. He attended West Virginia University to study electrical engineering and was later posted in Washington, D.C.

"When we came back with advanced degrees in electrical engineering, we were given assignments that began to apply this technology," Hancock says. "Even then, the chief signal officer knew that data processing was going to assume a very significant role in the Army."

By the late 1950s, Hancock found himself assigned to the U.S. Army Computer Systems Directorate, which was part of the Signal Corps. Back then, Hancock notes, the Army had computers from IBM, Sperry Corp.'s Univac division, Burroughs Corp., Honeywell, Inc., Bendix Corp., General Electric Co., Control Data Corp. and NCR Corp.

Getting these systems to interchange data was a nearly impossible task, particularly since the concept of writing portable software under Unix was still decades away. To get some measure of compatibility, Hancock says, the Army had to rely on writing programs in standard languages such as Cobol and on recompiling programs for use on different machines.

Hancock later moved to the center for Army information systems at Fort Huachuca, Ariz. Then he retired — for the first time — in 1978.

Transplanting roots

Soon after, though, Hancock was ready for his first "repotting." He moved to New York, where he became senior vice-president of MIS at Chemical Bank. Later, he moved to Wells Fargo Bank in San Francisco, where he was an executive vice-president of MIS.

Although Pacific Bell does not have as many incompatible CPUs as Hancock faced in the Army, there are still large chunks of proprietary IBM, Digital Equipment Corp. and Unisys Corp. code in the dozens of mainframes that power the telecommunications network.

In view of that mixed-vendor environment, Hancock's strategy is to aim at the Netsys architecture of the 1990s and to continue to add nonconforming systems as needed.

"We have a vision of Netsys, and then we ask how we're going to get to that vision," he says. "The trick is deciding how wide a [variation] we can tolerate on the road to getting there. We've realized that we can't afford to redesign applications every three to five years. We'd like to be able to change out the hardware to take advantage of new technology without changing the applications."

Help Wanted: Heroes and visionaries preferred

BY JAMES A. CHAMPY
and MICHAEL HAMMER

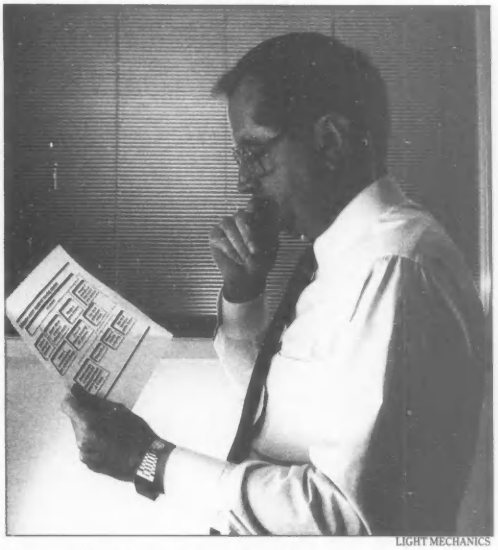
An increasing number of information systems executives are discovering that their ability to deliver on the huge potential of information technology stumbles on one point — the information systems human resource.

A typical scenario runs something like this: The new IS executive at a manufacturing company successfully convinces his management of his vision for information technology. As he paints it, information technology can be used to reengineer archaic processes, deliver vital decision-making information to the company's top managers and generate new products and services — in general, to transform the way the corporation and its people work.

But as soon as the executive gets the green light and starts trying to deliver on his promises, he runs into a stiff challenge from his own staff. For years, these people have been building and maintaining the usual fare of corporate systems: financial systems, order processing and the like.

Implementing the chief's new vision would require the staff to take an aggressive role in the corporate organization. At minimum, they would have to build systems for which there were no prior models and develop intimate working relationships with people in the business units. These are adjustments that they are not prepared to make.

As a result, the IS executive's rosy dreams turn into a nightmare. Sixteen months after he arrived, the applications backlog has only grown bigger. Systems that were supposed to process orders faster, simplify customer interaction and dovetail sales and service information are nowhere to be seen. The IS staff is in turmoil. And the credibility of the IS organization has plummeted.



LIGHT MECHANICS

IS executives *need people who can help them deliver*

Similar dramas are being acted out in many organizations right now, and unless a better match can be engineered between what is required of IS departments and the people staffing those organizations, the situation will worsen. As IS managers are starting to realize, their staffs are populated with people who are not up to meeting contemporary challenges. The most common complaints center around the following:

- Analyst "scribes" who simply record users' specs and complaints without digging into the root of the business problem. As one manager put it, "Much of the business of IS is carried out by lower level programmer/analysts taking instructions from low-level clerks."
- Technology experts who are afraid to broaden their horizons for fear of decreasing the perceived market value of their narrow specialties.
- Opposing camps of self-declared technologists — one believing that every useful solution requires IBM's CICS, and the other insisting that all meaningful work can be done with a PC and a spreadsheet.
- Staff who are oblivious to the business they are in and indifferent to learning it, preferring to think of IS as their business.

Obviously, something has to be done to address these limitations, but the measures taken are not so obvious. Past attempts to upgrade the performance level of IS staffs have often failed, and managers are not always sure why. Some have tried recruiting users and MBAs into the IS organization, only to have the transplants rejected by the department's technology-oriented culture. Others have hired brighter, more versatile technical people, only to see them driven away by the mundane work load.

The fact is that the people IS organizations need to help push their businesses forward require a new kind of environment in which to work. Changing the face of IS means going beyond just instituting new hiring practices. It means changing the skill mix, the organizational structure, the management methods and the value structure.

Revising the skill mix

The work of the IS organization is changing in ways that devalue some existing skills.

For the last 30 or so years, information systems has operated as a "business within a business" — a department of specialists who waited for business people to define their requirements for a system they wanted, then took those requests back to their own sphere and translated them into program code.

More and more, however, this work is being shifted away from the IS area. Organizations are finding that, for many of the more straightforward applications, commercially available, packaged software is adequate. In addition, many of those who use systems are now capable of building their own.

The real utility of the IS organization no longer lies in routine development. Instead, the kinds of tasks in which the specialists can shine are in the rapid development of competitive and, to a certain extent, speculative systems; in harnessing disparate and leading-edge technologies; and in helping to redesign business processes through information technologies.

These are jobs that call for a

Champy, a vice-chairman of the Index Group, Inc., heads the firm's IS human resource practice. He also oversees Index's research services, including PRISM. Hammer, president of Hammer & Co., is co-director of PRISM.

INSIDE

Conventional training is not enough
Page 80

To have staff is not the same as to hold
Page 82

WHY YOU SHOULD CON
386 SYSTEMS, DESPITE THEIR

Our new 386^-based systems are priced about 35% less than comparable systems–like Compaq's^. Which may make you wonder if we've left something important out. Like high performance.

Well we haven't.

In fact, these are among the fastest 386-based systems available. With more advanced features than you'd get in systems that list for up to $3000 more.

Like Compaq's.

For instance, our 20 MHz System 310 offers you the most extraordinary value available in any 386-based system. It's the machine that PC Magazine (6/14/88) described as "fast enough to burn the sand off a desert floor."

THE DELL 25 MHz 386 SYSTEM 325.

STANDARD FEATURES: • Intel^ 80386 microprocessor running at 25 MHz. • 1 MB of RAM* expandable to 16 MB using a dedicated high speed 32-bit memory slot. • Advanced Intel^ 82385 Cache Memory Controller with 32 KB of high speed static RAM cache. • Page mode interleaved memory architecture. • VGA systems include a high performance 16-bit video adapter. • Socket for 25 MHz Intel 80387 or 25 MHz WEITEK 3167 math coprocessor. • 5.25" 1.2 MB or 3.5" 1.44 MB diskette drive. • Enhanced 101-key keyboard. • 1 parallel and 2 serial ports. • 200-watt power supply. • 8 industry standard expansion slots.

**Lease for as low as $245/Month.
The Dell System 325 is an FCC Class A device, intended for business use only.

SYSTEM 325	WITH MONITOR & ADAPTER	
Hard Disk Drives	VGA Mono	VGA Color Plus
150 MB-18 ms ESDI	$6,799	$7,099
322 MB-18 ms ESDI	$8,799	$9,099

SYSTEM 325 AND 310 OPTIONS: • Intel 80387 math coprocessor: 25 MHz for 325; 20 MHz for 310. • 1 MB or 4 MB memory upgrade kit. • 2 MB or 8 MB memory expansion board kit. • Dell Enhanced Microsoft® MS-DOS® 3.3. • Dell Enhanced

AND IF THAT SOUNDS FAST, WAIT TILL YOU SEE OUR NEW 25 MHz 386-BASED SYSTEM.

At 25 MHz, our new System 325 offers you the highest possible performance in a 386.

Like the System 310, it utilizes the very latest technology, including the Intel^ 82385 Cache Memory Controller, advanced 32-bit architecture and high performance drives. And of course, both systems are fully IBM^ PC compatible.

But speed isn't the only reason to buy from Dell. Or even the best.

THE FIRST PERSONAL COMPUTER THAT'S TRULY PERSONAL.

When you order from Dell, we custom configure a system to your exact personal specifications. After evaluating your business needs, we will help you select the features that are right for

All prices and specifications are subject to change without notice. Dell cannot be responsible for errors in typography or photography. **Payments based on a 36-month open-end lease. ^Service in remote locations will incur additional travel charges. △For the complete terms of our On-Site Service Contract, Satisfaction Guarantee, Warranty, and leasing plans, write: Dell Computer

TO ALLAY YOUR SUSPICIONS, CALL 800-426-5150.

For more information on Dell's 386™ and 286-based systems, send for our free color catalog. It also provides full details on our printers, peripherals and software. And on the unmatched service and support that's included in the price of your system. Call (800) 426-5150 or return this card today. In Canada, call (800) 387-5752.

☐ Please have a Dell representative call me.

DELL COMPUTER CORPORATION

Name:_____

Company:_____

_____

Address:_____

_____

City:_____

State:_____ Zip:_____

Phone:_____

©1988 DELL COMPUTER CORPORATION. 386 is a trademark of Intel Corporation. SHH

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 6745 AUSTIN, TEXAS

POSTAGE WILL BE PAID BY ADDRESSEE

DELL COMPUTER CORPORATION
DEPT. ME
9505 Arboretum Boulevard
Austin, Texas 78759-9969

SIDER THE NEW DELL SUSPICIOUSLY LOW PRICES.

THE DELL 20 MHz 386 SYSTEM 310.

STANDARD FEATURES: • Intel 80386 microprocessor running at 20 MHz. • 1 MB of RAM* expandable to 16 MB using a dedicated high speed 32-bit memory expansion slot. • Advanced Intel 82385 Cache Memory Controller with 32 KB of high speed static RAM cache. • Page mode interleaved memory architecture. • VGA systems include a high performance 16-bit video adapter. • Socket for 20 MHz Intel 80387 or 20 MHz WEITEK 3167 math coprocessor. • 5.25" 1.2 MB or 3.5" 1.44 MB diskette drive. • Enhanced 101-key keyboard. • 1 parallel and 2 serial ports. • 200-watt power supply. • 8 industry standard expansion slots.

**Lease for as low as $140/Month.

SYSTEM 310	WITH MONITOR & ADAPTER	
Hard Disk Drives	VGA Mono	VGA Color Plus
40 MB-28 ms	$3,899	$4,199
90 MB-18 ms ESDI	$4,699	$4,999
150 MB-18 ms ESDI	$5,199	$5,499
322 MB-18 ms ESDI	$7,199	$7,499

Microsoft MS-DOS 4.0. • Both MS-DOS versions with disk cache and other utilities. • Dell Enhanced MS® OS/2. *640 KB is available for programs and data. The remaining 384 KB is reserved for use by the system to enhance performance.

you. After your system unit is custom built, we burn-in everything to make sure the entire system works perfectly.

TOLL-FREE SUPPORT AND ON-SITE SERVICE INCLUDED IN THE PRICE.

Every Dell system includes a complete set of diagnostic tools. So troubleshooting is easy. In fact, most problems can be resolved over our toll-free support line. It's staffed by Dell's own expert technicians from 7 AM to 7 PM (CT) every business day.

And if your system requires hands-on service, a technician will be at your location the next business day. At no cost to you.◊

TO ORDER, PLEASE CALL
800-426-5150
IN CANADA, CALL 800-387-5752

Included in the price of your system is a full year of on-site service.

But that's not all. You're also protected by our 30-day money-back guarantee. And our one-year limited warranty on parts and workmanship.△

AND IF YOU STILL THINK YOU GET WHAT YOU PAY FOR, CONSIDER THIS.

When you buy from Dell, you buy directly from our manufacturing facility in Austin, Texas. Which means we eliminate dealer markups, allowing us to give you a lot more 386 for less. We can even design a custom lease plan for your business, which gives you another way to save.

So go beyond your suspicions. Call us at (800) 426-5150 and order the system that's right for you.

DELL COMPUTER CORPORATION

Corporation, 9505 Arboretum Blvd., Austin, Texas 78759-7299. In Canada, configurations and prices will vary. Microsoft, MS and MS-DOS are registered trademarks owned by Microsoft Corp.
˜Signifies trademarks of entities other than Dell Computer Corporation. ©1988 DELL COMPUTER CORPORATION.

AD CODE NO. 11H11

Heroes wanted

CONTINUED FROM PAGE 69

very different skill set from that which has been prevalent in IS organizations until now. They demand a tolerance for ambiguity and an understanding of the competitive environment within the industry. They also require a finely honed sense of where technologies are going and how they interrelate and the ability to build close and productive working relationships with line and staff managers.

The Partnership for Research in Information Systems Management (PRISM), a joint research offering of Index Group, Inc. and Hammer & Co., two Cambridge, Mass.-based research and consulting firms, began to conduct research in this area in 1986. Since then, PRISM has found three new IS roles emerging, tagging them with whimsical but highly descriptive titles: "Witch Doctors," "Magicians" and "Wizards."

Witch Doctors are leaders in the effort to revitalize the business. Think of them as internal consultants, advocates or change agents, but first and foremost they are business process redesigners. These individuals can understand a company's managerial and operational processes and conceptualize how information and information technology can create new paths.

Managerial processes are the ways managers gather information, make decisions and interpret the results. Operational processes are the sequential steps that lead to a product or service; for example, the continuum of research and development, procurement, manufacturing, marketing, sales, distribution and service.

Envisioning new ways of structuring these processes requires a daring thinker, which is what a good Witch Doctor is. As one IS manager put it, Witch Doctors are "people who can think independently of what they are being told."

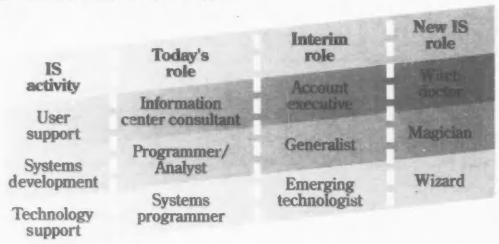
But independent thinking is only part of the picture. Redesigning managerial and operational processes is only possible if IS people are able to work in lockstep with business people.

Such partnerships do not happen easily. A Cobol programmer of financial systems cannot be thrust into a securities-trading operation and overnight become a "partner" with traders in overhauling the trading function. For one thing, a Cobol programmer would probably be lacking some essential communications skills, such as listening, relationship management and salesmanship.

Witch Doctors must be salesmen for change and innovation, enlisting support for specific changes, keeping implementation on track and pulling all the levers to make sure the change succeeds.

Work shift

Information systems work will move toward business process redesign and integration but must pass through an interim stage emphasizing partnership and front-office support



SOURCE: PRISM (INDEX GROUP AND HAMMER AND CO.)
CW CHART: TOM MONAHAN

The new breed

The actual building of new types of systems demands a new breed of developer — the Magician. People skilled at building large systems without having a complete design are needed to get these systems moving into high gear and rapid use.

Magicians are already at work, unrecognized, in some organizations. They are the "order of magnitude" programmers who consistently produce many times the output of their typical colleague, with a knack for spotting business design flaws. If a special project is performed in "skunkworks" fashion, a Magician-in-the-making is the person who naturally emerges as chief skunk.

Magicians are people who thrive on ambiguity and difficult situations. They have the capacity to conceptualize an entire system — even if all the details are unclear at the outset. The hallmarks of their method are the flexibility with which they approach problems using technology and the speed and intensity with which they build systems.

The passion that Magicians feel about doing things right is exceeded only by their passion for results. In other words, Magicians are willing to change their views to get the job done.

In addition to process redesigners and result-oriented programmers, IS organizations need workers who have expert knowledge of advanced technologies — particularly in integrating multiple, disparate technologies. These are the Wizards.

Wizards are characterized by genuine technical expertise and a wide-ranging tool kit. They not only build complex systems but can bring to bear the latest, most appropriate technical tools. Wizards play three major roles: researcher, teacher and builder. They must investigate emerging technologies, be responsible for technology transfer and introduce the new technology into the corporation.

Organizations need Wizards to stay on top of new technological trends and experiment with new technologies. Wizards also help the business determine which technologies are potentially transformational and which are essentially useless.

There has been much clamor of late for technologists who have rich business knowledge and skills. But in the years to come, IS organizations will need even more top-notch technologists who can integrate the heterogeneous information systems found across the corporation. These organizations will count on their technical experts to oversee the merger of voice, data and visual technologies; manage the construction of elaborate databases connected across business functions; and follow through on other complex technology initiatives.

To understand how the infusion of

!#?*

TO MOST PROGRAMMERS, TEST IS A FOUR-LETTER WORD.

Everyone knows that software testing isn't a job that inspires kind words. In fact, even the most patient programmers and users have been known to spout strings of expletives when facing endless testing tedium.

But now you can clean up your act (and your testing) with TRAPS.® The revolutionary PC-based Testing/Recording And Playback System that increases testing productivity by up to 800%.

TRAPS automatically detects and captures mismatches in data, cursor positioning and attribute bytes – without the need for coding test scripts. With TRAPS, even the smallest discrepancies are identified and isolated – before they cause problems in production systems.

TRAPS. The Testing/Recording And Playback System you can swear by. Not at.

For more information or a demonstration of our completely automated acceptance and regression testing tool, call us at 1-203-277-9595 or 1-800-842-TRAP

TRAVTECH Inc.

One of The Travelers Companies, One Tower Square, Hartford, Connecticut 06183

TRAPS is a registered trademark of TRAVTECH, Inc.

"Cache in your processor"

SDI

20 years of Software Innovation

For Instant access to your critical application files with CACHE MAGIC™

Improve response times	making your users more productive and allowing you to process more transactions.
Reduce batch run times	knocking 2 to 4 hours off nightly batch processing, insuring the online system gets up on time.
Save hardware dollars	postponing and possibly eliminating upgrades of CPU, DASD, and Control Units.

CALL TODAY. 1 (800) 537-1969

(415) 572-1200 In Europe: +31 10 436 12 77 1700 S. El Camino Real, San Mateo, CA 94402

Who they are and where to find them

No one is going to stroll in and apply for the new information systems positions described here. IS managers will have to be able to spot the right qualifications and qualities to recruit the individuals who can bring these roles to life. The following is a brief summary of what the jobs require and where to look to fill them:

Title: Witch Doctor.
Role: Leader in business process redesign via information technology.
Qualifications: Better-than-average technical skills, superior understanding of the business and its industry, broad and deep business knowledge and superior communications and persuasion skills, particularly with end users and general management.
Candidates: Business people with an advanced degree plus IS experience. These individuals can be found internally, working as planners or business managers with experience in multiple functions, or externally working for industry consulting firms.

Title: Magician.
Role: Leader in building sophisticated systems rapidly and iteratively using only semidefined specifications and methodologies.
Qualifications: "Order of magnitude" productivity as a programmer, knack for elegant solutions, ability to envision large, complex systems in his head, intense, energetic work style, leadership by example and superior communications skills, particularly with IS professionals and users.
Candidates: IS professionals with an advanced technical degree. Such people can be found internally in systems development, in which they would naturally emerge as project team leaders. Externally, look in vendor organizations, contract development firms and aerospace and defense organizations that typically build large, complex systems.

Title: Wizard.
Role: Technical expert who leads efforts to identify, introduce and deploy leading-edge technologies with potential for the business.
Qualifications: Broad knowledge of new and emerging technologies, guru-level technical breadth and depth, a personality stimulated by anything new, a work style characterized by experimentation and a knack for handling multiple projects at once, the ability to envision the business value of new technology and communications skills oriented toward IS professionals and users.
Candidates: IS or computer science professionals with an advanced degree, possibly a Ph.D. Usually found internally in systems development, technology architecture or new technology introduction groups; externally, at technology vendors where they have a charter to push the limits of technology.

JAMES A. CHAMPY
and MICHAEL HAMMER

these new skill sets would affect IS organizations and the business as a whole, consider the following applications development example:

The need: A vice-president of sales has heard that other businesses are starting to automate their sales forces and decides he also wants to use computers to make his sales team more efficient and effective. Exactly how this could be done, he does not know.

The traditional response: The IS organization gathers a group of intended end users to define the system's requirements. In all likelihood, the group is made up of lower level sales personnel, because the vice-president of sales has little time to think or talk about technology.

The requirements group defines the functionality of the system and then has the information systems representative make a reasonably detailed design of the system. From this point on, the system's creation proceeds without much, if any, input from the ultimate customer.

The typical result: Months or even years after the fact, a system is produced that automates existing processes (such as putting the sales tickler file on a computer), but does little to transform the sales approach.

Furthermore, this system is fixed and final. It cannot change as the needs of the sales force change, because the IS staff has no continuing involvement in the sales function.

The new response: In a setting in which the IS organization has made room for the new kinds of employees we have described, the response and the outcome would be quite different. A Witch Doctor would have previously formed a partnership with the sales department and already developed an understanding of the selling process, the customers and their needs, the competition's sales approaches and marketing channels.

More important, the Witch Doctor would understand how a new approach to selling could affect existing work methods and incentive structures. That person could then determine how to engineer the system to minimize disruption while maximizing desired results, such as better cross-selling through information sharing, improved prospect identification and the development of tailored offerings.

Working from the concept spelled out by the Witch Doctor, the Magician would build the system. Most likely, he would build it in stages to give the sales force a chance to shape successive iterations.

The Magician would actively promote the system to the sales force and to other departments whose cooperation is needed. He would also help manage the expectations of the sales vice-president and other senior managers while the system is under development.

While the planning and construction is under way, the Wizard would stand ready to suggest any appropriate leading-edge technologies that would help make the new sales process a success. He or she would ensure the most bang for the buck in hardware, looking out for dramatic technology innovations. This Wizard would find a way to tie the sales system into the corporate information architecture and would make sure no procurement glitches blindsided the project.

• **The new result:** In terms of this example, the impact of these new employees and this new style of working would be to produce a more effective, more popular and long-lived system for sales automation.

Actually, however, the largest gains from these kinds of changes are not realized in narrowly defined applications but in broader initiatives. Mandates such as "Cut our product development time in half" or "Boost product quality and reduce our defect rate by 50%" are ideal for the kinds of employees described here. Because they stand outside any one business area, Witch Doctors, Magicians and Wizards are in an excellent position to attack these broader initiatives and get them off the ground.

Before these new kinds of roles can be inaugurated and any real improvement in the overall human resources situation can be realized, IS managers will have to rethink the value systems that govern the way that work is performed.

Zero tolerance

The prevailing ethic in most IS organizations puts qualities such as precision, logic, thoroughness, reliability and control at the top of the list. This ethic rewards risk

Role change produces small numerical difference

Within a 100-person staff, there would be three fewer systems programmers, six fewer developers of new systems and one less end-user specialist

	Staff before	Staff after
Operations	45	42
Installed systems support	45	38
Management/ Other	10	10
Witch doctor		1
Magician		3
Wizard		1
Staff totals	100	95

SOURCE: FHRM (INDEX GROUP AND HAMMER AND CO.)
CW CHART: TOM MONAHAN

AutoImport™

Steer Your Data Automatically Where You Want It!

It may not look like a Porsche or take the corners like a Ferrari, but AutoImport™ can steer your data where you want it!

Introducing the quick, easy way to import files into spreadsheets and databases. It's the universal solution to bridging application boundaries by providing exceptional data interchange. And, it eliminates typing errors and the tedious task of re-keying forever!

PUTS YOU ON THE FAST TRACK WITH INCREASED PC PRODUCTIVITY!
▪ Imports information from mainframe and PC ASCII files into PC spreadsheets and databases
▪ Intelligently translates information so that it is immediately useable by your favorite applications
▪ Translates just the information you select
▪ Eliminates re-keying time and errors

ELIMINATES ROAD BLOCKS LIKE COMPATIBILITY PROBLEMS!
▪ Imports to Lotus 1-2-3, Symphony, Excel, Quattro, dBASE II-IV, Sylk, DIF and more
▪ Combines, Appends, Inserts data to existing reports
▪ Information can go between applications
▪ Works on all DOS personal computers
▪ There are not any host computer requirements

EASY TO HANDLE AND USE!
▪ Uses Lotus-style commands and menus
▪ Visual interface with point-and-shoot operations
▪ Provides on-line help
▪ Requires no support from MIS resources

Priced at just $169.95, AutoImport is the vehicle to help increase overall departmental and individual efficiency and productivity. Brought to you by the makers of the award-winning file transfer utility, The Brooklyn Bridge.™

See your local dealer today or call White Crane Systems at (404) 446-0660.

WHITE CRANE SYSTEMS, INC.
6400 Atlantic Boulevard
Suite 180
Norcross, GA 30071
(404) 446-0660
See us at Booth 6068
COMDEX

avoidance, security, conformity, patience and — all too often — a tolerance for mediocrity. The new breed of IS employee cannot thrive in and will not settle for an environment that is characterized by these values.

Instead, IS organizations must exalt innovation, creativity, leadership, entrepreneurship, flexibility, urgency and intensity. The new ethic must favor a willingness to take risks, an ability to tolerate ambiguity, aggressiveness rather than just responsiveness and a drive for excellence.

New orientation

Working with these new human resources models will — in most corporations — require a new structure for the IS organization. The structural difference will not, however, be in size; overall, we expect that the addition of Witch Doctors, Magicians and Wizards will reduce conventional staff levels only slightly. Rather, the difference will be one of orientation.

Equitable recognition and awards will be very important in terms of attracting, developing and holding the kinds of employees that IS organizations are going to need. Contributions to the organization must be recognized and rewarded fairly, and structures that encourage mediocrity should be scrapped.

One large industrial company, for example, is changing its incentive structure so that IS staff members can grow professionally and financially through the acquisition of skills rather than the progression of rank.

In addition, this company is flattening the IS organization by cutting the number of management levels from 14 down to six. Hierarchical structures are inhibiting to those who believe the opportunity to perform an important task is more important than progressing up an organization chart. Flat or horizontal structures are more suitable.

Other IS organizations have restructured in order to develop better relations with their users. One has institutionalized an account management program, whereby an information systems person is given complete responsibility for managing the relationship with a particular business function.

One advantage of this kind of arrangement is that, if someone in the business department has a problem with systems, they have a "point person" to call.

Other advantages

Another benefit is that because the position is defined, for example, as account management rather than technical support, the focus of the position is on making sure that needs are being met and not just that a particular information system is proceeding on target.

Strong performers are naturally attracted to new challenges, products and services, technologies and business and management issues.

Partnership with peers is also rewarding to the IS professional in this

No other application development software is quite this fast.

Sure, you expect speed. But not this much speed. Truth is, anyone who has ever developed applications is surprised by PROGRESS. Like the developers who gave it the highest satisfaction rating among the 4GL DBMSs surveyed by DATAPRO.*

PROGRESS is a high-performance 4GL designed specifically for building, modifying, and customizing database applications. It requires less code than other 4GLs, it's crash-proof, has SQL, and it's transparently portable across UNIX, XENIX, ULTRIX, AIX, MS-DOS, VAX/VMS, and CTOS/BTOS, as well as LANs.

Well, hold your horses.

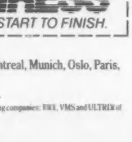
NOW PROGRESS APPLICATION DEVELOPMENT IS EVEN FASTER WITH PROGRESS FAST TRACK.®

PROGRESS FAST TRACK is a menu-driven application builder that allows developers and users to paint screens, create menus, generate reports and perform queries. Unlike other application builders, PROGRESS FAST TRACK provides you greater flexibility and control by generating 4GL code.

For only $95†, you can test drive a copy of PROGRESS. And if it's not as fast as we say it is, we'll refund your money. So call today.

And hang on tight.

Send $95† for your PROGRESS Test Drive.
Or call: Progress Software Corporation
5 Oak Park
Bedford, MA 01730
1-800-FAST 4GL
(In Massachusetts, call 617-275-4500)
FAX: 617-275-4595
Telex: 509965
(In Canada, call 416-620-6766)



PROGRESS®
FASTEST FROM START TO FINISH.

Offices in: Atlanta, Boston, New York, San Diego, Washington, D.C., Amsterdam, Brussels, Cologne, Copenhagen, Helsinki, London, Melbourne, Montreal, Munich, Oslo, Paris, Reykjavik, Stockholm, Sydney, Toronto, Vienna, and Zurich.

*DATAPRO Reports on Software, DATAPRO 70© 1986, 1987, DATAPRO RESEARCH CORPORATION. †For international orders please call for shipping and handling information.

PROGRESS and PROGRESS FAST TRACK are registered trademarks of Progress Software Corporation, developers of advanced software technology for business and industry. The following are trademarks of the following companies: VAX, VMS and ULTRIX of Digital Equipment Corporation; UNIX of AT&T; MS-DOS and XENIX of Microsoft Corp.; CTOS of Convergent Technologies, Inc.; BTOS of Unisys Corporation.

Managing the new mix

IS managers may find it hard to deal with the new kinds of worker in their departments.

Strong performers may also be eccentric and impatient with those less bright or capable than themselves. Independent self-starters may not want to live within the rules.

The watchword for managing these individuals is leadership. Tolerance must prevail over authority, inspiration over administration, influence over task management.

There is no question that managing IS employees is going to be a tougher job once these exceptions become the norm. But by the time that happens, IS managers will have changed quite a bit themselves.

A few years hence, managers in this area will most likely be "doers" themselves. They will not be threatened by having subordinates who may be brighter or have more expertise than they do. They will concentrate on staff development, leaving task management to the individuals. Most important, they will be responsible for nurturing an atmosphere of flexibility, individual freedom, stimulation and challenge, reaping the rewards that go along with ambitious projects.

If this sounds like a revised job description, it is. In the new environment that they are working to create, IS executives will also be fitting themselves into a new role, one that might best be described with a title such as "chief alchemist."

This transformation will not happen overnight, so there is no need to reverse all your policies and management systems or start interviewing successors. The first Witch Doctors, Magicians and Wizards won't arrive on your staff overnight; when they do, they will form a special team that naturally develops a special environment and special management methods. As their numbers grow, so will your skills in dealing with them.

JAMES A. CHAMPY
and MICHAEL HAMMER

Why is COMPUTERWORLD the best read publication* among MIS executives in America?

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
COMPUTERWORLD
INSIDE
Court: States may tax net traffic
On SQL Server's test trail
NAS deal brings new lineup to plug-compatible market
Chip prices drop; PC prices don't
SECOND CLASS MAIL

Because it's America's "Best Computer Newspaper"**

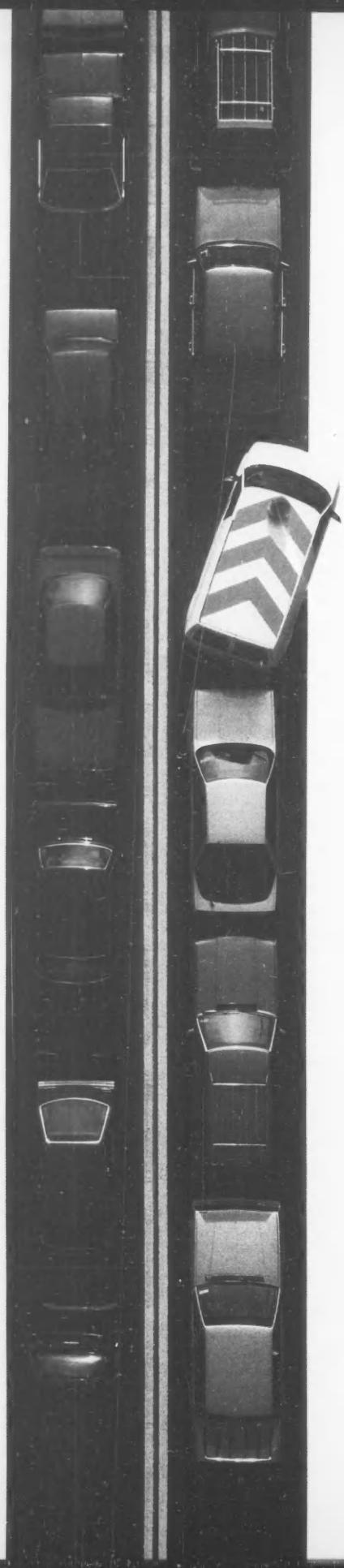
Can you afford to be last on the routing list for the news you need? Well now's the time to order your own subscription to COMPUTERWORLD. That way you'll stay abreast of all the latest news, products, people, developments, trends and issues — things professionals like you need to know to get ahead. And stay there.

Don't delay, order now. You'll get 51 information packed issues. Plus special bonus sections of COMPUTERWORLD Focus on Intergration. You'll also get our special Spotlight section . . . featuring detailed head-to-head comparisons of the industry's latest products.

Use the postage paid subscription card bound into this issue and get your own subscription to COMPUTERWORLD.

* The Wall Street Journal (1987) — "Survey of the Information Processing Marketplace".
* The Adams Co. (1988) — "Information Processing Management Study."
** Third Annual Computer Press Awards Competition (4/12/88)

COMPUTERWORLD



Imagine

e a major highway with only two lanes.

Now you know why you need Micro Channel from IBM.

Picture it.

Rush hour traffic. Two narrow lanes. All backed up and no place to go.

If you're lucky, this isn't the situation you face on the road every day. But it does describe what's going on inside most personal computers.

That's why IBM developed the Personal System/2® with Micro Channel.™ Micro Channel gives the PS/2® more "lanes" to handle the flow of information. Within your system. And between systems. It's a veritable superhighway. With an impressive combination of speed and reliability that leaves ordinary computers far behind.

Best of all, the IBM Micro Channel delivers data faster and makes the most of your expansion card performance, all with improved reliability. And when you're ready to add new cards, including the latest "intelligent" ones, Micro Channel gives you an easy, switchless way to do it. More proof that when you're thinking ahead, you're thinking IBM.

Ask your IBM Authorized Dealer or IBM marketing representative about the IBM Personal System/2 with Micro Channel. For a dealer near you, call 1 800 IBM-2468, ext. 121.

Just make sure you fasten your seat belt.

IBM

IBM, Personal System/2 and PS/2 are registered trademarks of International Business Machines Corporation. Micro Channel is a trademark of International Business Machines Corporation. © IBM Corp.

kind of situation. Stars want other stars around them — it signals an organization that appreciates and rewards creativity. In addition, collaboration among high-powered peers is more likely to produce better ideas.

Other environmental features important to the development and retention of top performers include flexibility and unstructuredness, a tolerance for risk-taking and a long-range vision for the organization.

Getting from here to there

The right conditions must exist in order to introduce new roles such as Witch Doctor, Magician and Wizard into an IS organization. A strong working relationship should already be in place between IS and the business units. Staff members must be capable of assuming the new and more demanding roles, or else the IS organization must have the wherewithal to recruit such individuals. Finally, the organization must be ready to make major changes.

When one or more of these ingredients is missing, as is the case in most organizations, then it is necessary to go through an interim stage to bring about gradual change and set the scene for these new types of workers.

Interim roles include the following:

Account managers: As described above, this role is one of liaison between a user organization and the IS function. Account managers are responsible for interpreting users' needs. They facilitate requirements definitions and applications planning, but lack the broad scope or powerful influence of Witch Doctors.

Generalists: These are flexible systems developers who can form a small team to get a key system off the ground. They are versatile and work rapidly, but fall short of the order of magnitude productivity levels of Magicians.

Emerging technologists: Individuals at this level scan all relevant new and emerging technologies but without the raw technical prowess of Wizards. They are drawn to the new and are adept at communicating technical capabilities to non-IS people, but they lack the innovation and creativity of Wizards.

Those who fill the interim roles may become candidates for the final roles, but this will happen infrequently because the full-fledged roles require higher orders of skill and scope. The interim roles will be important but will not automatically turn into Wizards and Witch Doctors.

Molding a traditional IS organization — even a very healthy one — into a community of top performers is an evolutionary process. Managers can expect their organizations to move through three broad phases:

- At first, the new breed of employee pops up here and there in the organization. They are top performers in context but do not make the highly leveraged contributions of which they are capable. Managers need to recognize them, retrain them and give them room to increase their individual contributions.
- Next, the pool of top performers is consolidated into a separate unit to give them identity and prove their value. This can be initiated as soon as the talent pool reaches critical mass; this phase may last two to three years.
- As the ranks of the new breed grow, and as their methods and attitudes are nurtured throughout the organization, they are dispersed and integrated so that their ethic permeates and eventually dominates the firm.

These phases are accompanied by many other deliberate changes initiated by IS management.

Further changes

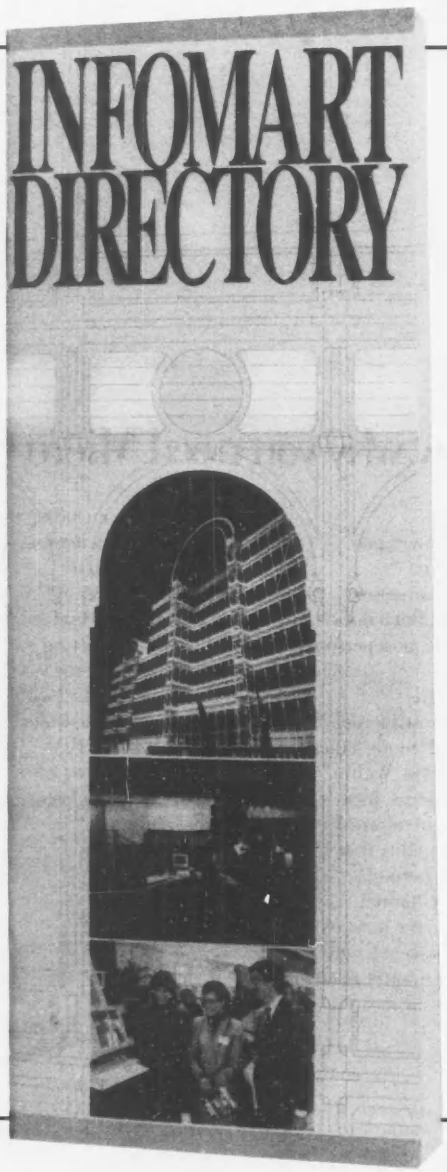
Job descriptions are rewritten, and the old roles of applications programmers, maintenance programmers, analysts and end-user computing staff are reshaped. At the same time, career paths and compensation structures are redrawn, perhaps with the idea of rotation, and certainly with alternatives to the typical march up the management ladder.

In related moves, new hiring programs are being launched to recruit from MIS and MBA programs and to comb the vendor community for technical talent, and training programs are being put in place.

The new IS environment will be based on what, for some, may seem like a revolutionary and unwelcome premise — that the success of developing an organization rests not on sprinkling resources evenly on everyone, but on zeroing in on a few strong individuals who will, over time, influence others.

Naturally, this requires an extremely deliberate effort on the part of IS management and many tough personnel decisions along the way. But the result should be a staff of bright and flexible individuals and a steady stream of powerful, rapidly developed systems. ●

INFOMART DIRECTORY



Call For Directory Assistance

The next time your corporate buying team needs assistance with a purchasing decision, make sure you have the INFOMART Directory handy. This free 60 page directory is your guide to everything INFOMART offers.

When you visit INFOMART, you can see and evaluate the latest in computer hardware, software, telecommunications, networking, consulting and training, all in a single convenient location. And you can use our directory to preview the more than 90 companies waiting to meet your technology needs.

Call for your free INFOMART Directory today and ask how our exclusive Executive Briefing Service can assist you even further by coordinating and expediting your entire visit to INFOMART.

INFOMART.

Where the leaders in automation share their knowledge with you.

1-800-232-1022

INFOMART, 1950 Stemmons Freeway, Dallas, Texas 75207
INFOMART is a registered servicemark of IFM Partnership.

YES! I Want to Integrate my Applications

- ☐ Please send me more information on TPX
- ☐ I'm interested in a FREE 30-day trial of TPX. Please have an account representative contact me.
- ☐ I'm interested in additional products to improve the productivity of my network. Please send me more information on the following:
  - ☐ STX (SNA-to-X.25)
  - ☐ NetSpy™ (for MVS or VM, circle one)

Name_____

Title_____

Company_____

Address_____

City_____ State_____ Zip_____

Telephone_____

Operating System(s)_____ No. of CPUs_____

VTAM Release_____

CW032089

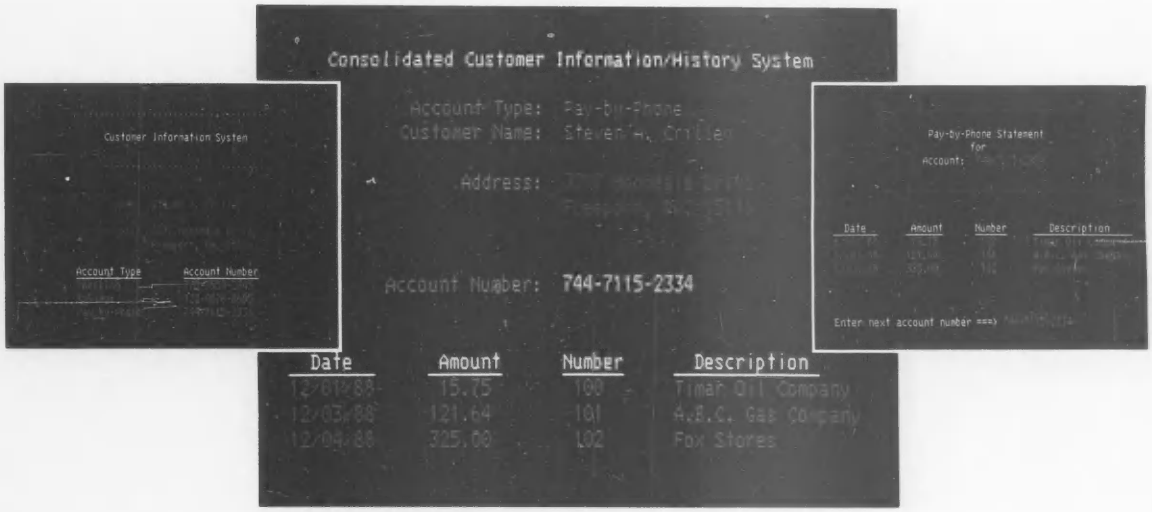
NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 13340 PITTSBURGH, PA

POSTAGE WILL BE PAID BY ADDRESSEE

Duquesne Systems Inc.
Two Allegheny Center
Pittsburgh, PA 15212

TPX®
Application Integration Made Easy



TPX Version 2.0—the New Standard in Session Management
Session managers allow users to switch among applications, but what happens when information is needed from two or more applications at the same time? TPX, the world's leading session manager, now sets a new standard for session management by providing Application Integration—easily.

Users Need Application Integration
Many times every day your users need to access and update information from multiple applications concurrently. For instance, a service representative using a Customer Information application under IMS sees a customer's name, address and a summary of accounts. While viewing this data, the service representative needs to access detailed information from the Account History application running under CICS. Think of the increased efficiency and improvement in customer service if information from two or more related applications could be combined on a single, interactive screen.

TPX Provides the Solution
TPX makes it easy to front-end your existing applications with your own customized screens. You can integrate transactions and data from any number of applications, giving your users a unified, standard view regardless of the format of underlying application screens.

TPX Does Windows Too
You can also integrate concurrent applications with TPX Windows, a powerful, full-function windowing facility. Either way, you will increase your users' productivity and your business' competitive advantage.

Discover the Benefits for Yourself
Return the attached reply card today for more information on how TPX 2.0 can help you integrate your applications in an MVS or VM environment or feel free to call **(412) 323-2600 ext. 444** in PA.

DUQUESNE SYSTEMS
Two Allegheny Center
Pittsburgh, PA 15212

©1989 Duquesne Systems Inc.

Stretching your staff to fit the future

BY STEWART STOKES

Extraordinary times call for extraordinary measures, and nowhere is that more true today than in staff development for information systems organizations.

IS managers are facing the need to reshape their organizations and staffs to meet new kinds of service demands, ones that presuppose an understanding of the business goals and the functions of individual business requirements. This kind of reshaping is never easy, but it is made more difficult by the fact that, while competition for IS professionals with "the right stuff" is intense, budget tightening often prohibits unrestrained bidding.

In more ordinary times, the standard formula for professional development was formal instruction such as courses, workshops and seminars. Worthwhile as those types of training may be, they tend to concentrate on the acquisition and honing of job skills, as opposed to the broadening of the individual.

More creative measures must be added to the mix if IS managers hope to turn their technical staffs into business support professionals. Some of the following strategies are currently being implemented by progressive IS organizations:

- Providing coaches and mentors.
- Forming partnerships with client departments.
- Initiating job-rotation schedules and mini-internships.
- Holding semi-structured roundtable discussions on emerging issues.

Yankee Atomic's Motyl-Szary

The first strategy, providing coaches and mentors to employees, is one that is familiar to most business managers, but few IS organizations have followed suit. Coaching refers to the process of having an upper level systems manager work very closely with an employee to help him learn skills that will enable him to advance in the department and organization.

Mentoring, a more personal approach, means entering into in-depth relationships with selected individuals to help establish their identities with key managers and customers. This process also allows employees to take on levels of responsibility that might be beyond the scope of their own personal resources.

Successful mentoring requires strong emotional commitments, which is not as prevalent among the managers and staffs of systems departments as it is among their colleagues in other areas, such as marketing, manufacturing and finance.

One place that has benefited from an organized coaching strategy is Yankee Atomic Electric Co. in Bolton, Mass. Marian Motyl-Szary, director of computers and telecommunications at Yankee, worked closely with one employee who moved from a job in the mechanical engineering department to a position as senior systems manager in the applications area. "This person was an excellent engineer and a big user of applications," Motyl-Szary says. "With coaching on both technical and people issues, we helped him become a first-class applications manager."

Motyl-Szary's coaching consisted of teaching the manager about the ins and outs of the systems department, showing him how to renegotiate deadlines with customers when necessary and helping him understand the importance of customer satisfaction.

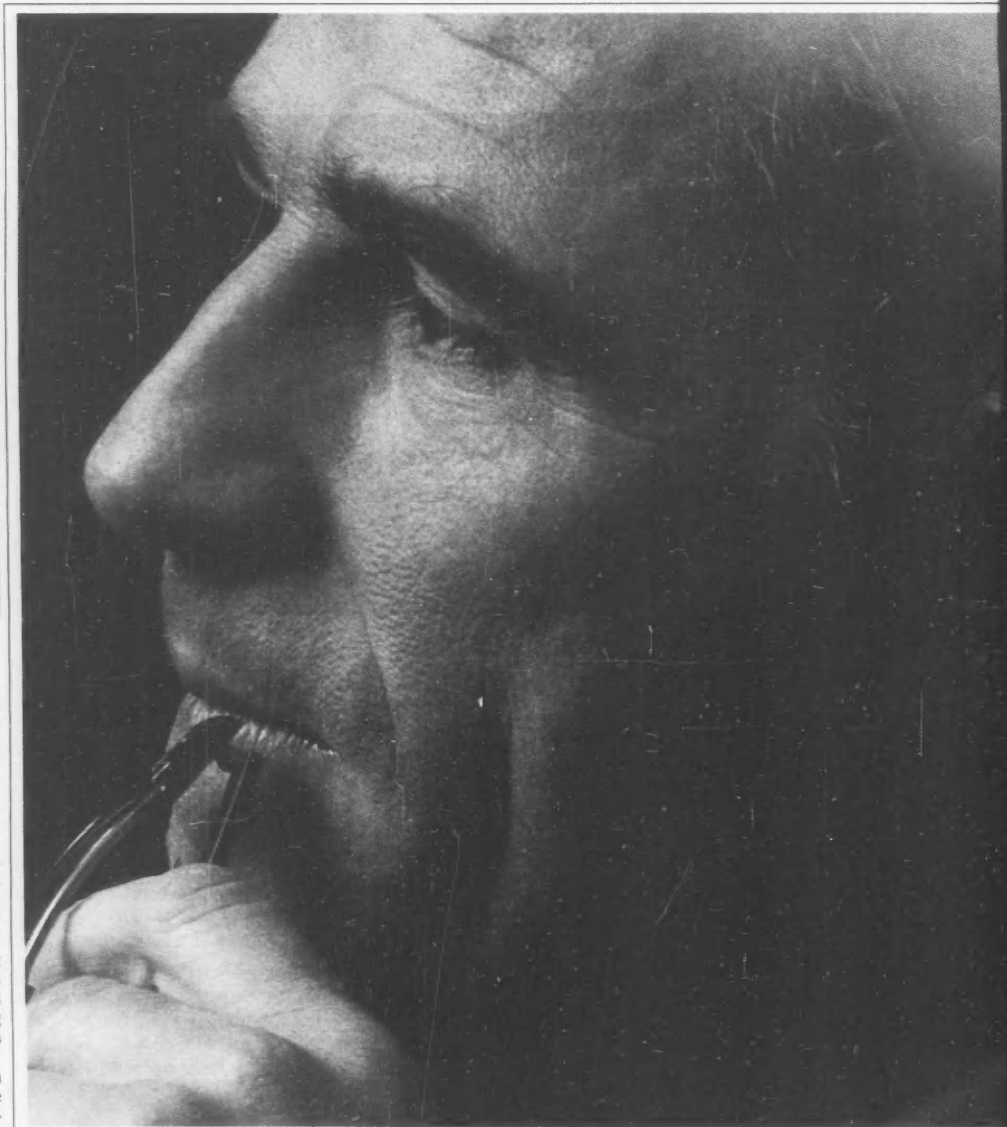
Motyl-Szary also helped the manager develop a prioritized action list, "so that he can tell me in five minutes what's going on in his department and what's going on with himself."

The second strategy, developing partnerships with client departments, is beginning to surface in IS organizations. Charles Hennon, director of computer information services at Cleveland Pneumatic Co., is a leading advocate of having client organizations work with an IS coordinator. "These coordinators have been well received," he says. "They have IS backgrounds but also know the clients' businesses . . . and give the clients direct input into information systems." These coordinators report directly to the client departments and meet with the client on a monthly basis to review projects.

Such partnerships help IS employees develop a better understanding of the organization's business strategy.

Another emerging professional development strategy involves rotating personnel between IS and client departments and offering mini-internships in user areas. Motyl-Szary rotates the job assignments of his employees to provide them with job enrichment experiences, increased motivation and the practical benefits of enterprisewide points of view.

At Fidelity Bank NA in Philadelphia, Catherine L. Button, senior systems officer, says the bank offers two internship programs to give IS professionals an in-depth appreciation of its businesses. One



Stokes is a senior vice-president of QED Information Sciences, Inc. in Wellesley, Mass.

program is open to all bank employees; the other was designed specifically for IS personnel.

In the general internship, known as the Professional Development Program, promising employees are sent on a five-month tour of other departments, spending time in branches and almost every functional department.

"Our systems people learn banking, and our bankers get to perform systems functions," Button says.

Once the employee has completed the internship program and a position is available, he may be able to change jobs and work in a different department.

The special "Career Path" program for IS staff offers employees 40 hours of formal training and 40 hours of work in a user department. Button says the program gives IS employees a chance to work for a week in the application areas they support, including check processing, cash management, trading and securities and international banking.

The fourth professional development strategy — holding semistructured roundtable discussions among IS staff, clients and managers — is inexpensive and easy to implement. The only cost is for books, journals and magazine articles that are used to facilitate the discussion. The usual process is to choose a hot topic each week, assign the reading materials, select discussion moderators and conclude with recommendations for action.

The main requirement for success when embarking on informal professional development is to view the entire organization as a learning resource. There may be some resistance at first, from both the information systems staff and the business units. Problems that can crop up center around the issue of power and influence. It may also be hard for both IS and client departments to find the time to get together. In addition, some organizations may have trouble implementing high user-exposure programs.

The rewards for persistence can be substantial, however. Such informal programs can increase the effectiveness of formal training. In addition, for modest outlays of time and money, firms can reap sizable benefits in more knowledgeable, competent, motivated and professional systems personnel. •

Planning for the '90s

Following a recent human resources symposium on information systems issues in Colorado Springs, Robert Zawacki, professor of management at the University of Colorado, and Roger Sobkowiak and Ronald LeBleu, managing partners of Software People Concepts, Inc. in New Haven, Conn., assembled 10 human resources executives who work in IS organizations to discuss key staffing issues and the steps they were taking to prepare their work forces for the 1990s.

The executives represented a cross section of industries, including banking, insurance, chemical and computer manufacturing. The following is a summary of some of the highlights of the discussion:

- Seven of the 10 executives said they had built competency models to help understand an employee's job requirements and capabilities. Some models were constructed by hiring a consultant; others, by an ad hoc committee of managers and individual contributors. Some built models for generic positions, while others did so to identify generic competencies that apply to all jobs. These models help in matching people and jobs as well as in defining training programs.
- Eight of the 10 emphasized use of in-house courses to help employees develop the competencies identified through modeling.
- Seven executives said that most new talent will be hired externally and that they will be looking primarily for unique IS experience, such as a network specialist. Six predicted a shift in recruiting specifications as they try to hire candidates with different backgrounds and more general business skills.

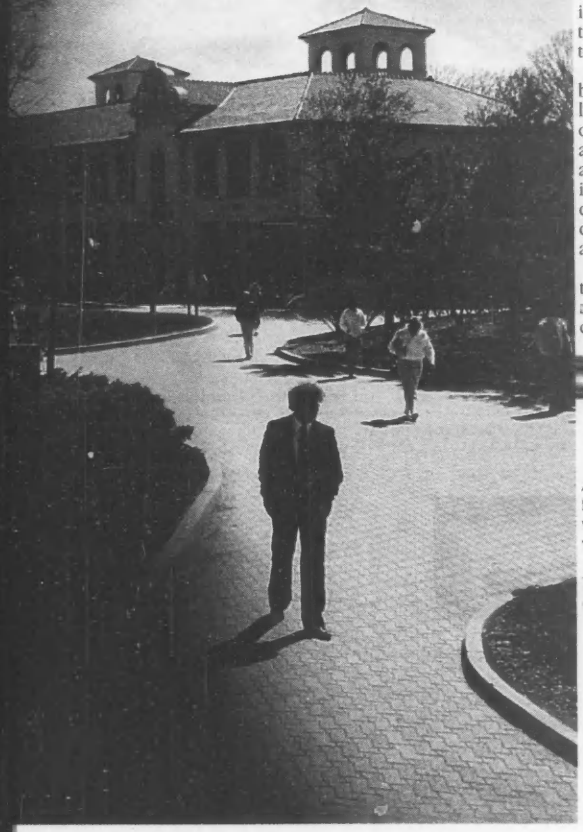
Although the primary source for new talent is college recruiting, most of the organizations represented define critical areas in which they need experienced people and then pay market or above to get those people.

- Eight of 10 said they plan and review development programs for IS professionals based on individual performance goals, career development plans and succession plans.

Participants were asked to describe what new activities they expected to implement in order to further develop their IS staff. Some of the following ideas emerged:

- Institute more job rotation between IS and business units to improve understanding of the business and increase motivation.
- Encourage mentoring.
- Support movement across functional lines.
- Evaluate new hires at 30-, 60- and 90-day intervals.

"Our college needed to enter the Information Age. But we weren't sure we could afford the price of admission."



For an educational institution, nothing is more important than the smooth exchange of information. That's why many colleges are making information networking a top priority.

The toughest challenge is connectivity. Colleges and universities, like most places, acquire computers and telecommunications hardware in patchwork fashion, ending up with little or no compatibility.

For one northeast college, AT&T Network Systems, working with the local telephone company, demonstrated that ISDN was the solution. Their information services manager explained: "ISDN gave us the best capabilities for the least cost. And we didn't have to trash our existing systems."

With central office-based ISDN, ordinary phone lines become the links in a fully interactive network. This translates into many applications and benefits. Voice and data can be transmitted simultaneously. For example, students and professors can confer with the Dean, who has on-line access to student records. Electronic mail streamlines internal communication, so course enrollment changes can be posted immediately. PC/terminal access to host computers and electronic file transfer extend every user's access to sophisticated software and multiple databases.

As the college's IS manager puts it: "ISDN can revolutionize the education experience. It's going to make us a better college. And, bottom line, a more competitive college."

The Future's on the Line.

This college is just beginning to tap ISDN's potential. At AT&T, we believe this potential goes beyond today's need for improved communications to pave the way to a larger vision—Universal Information Services—a world of services on demand.

For more information, call the AT&T Futureline, 1-800-638-7978, ext. 0310.

© 1988 AT&T

AT&T
The right choice.

How to keep headhunters at bay

BY DAVID GABEL

Finding good help is not getting any easier, but hanging on to the skilled people you do find is getting a lot tougher — at least if you are an information systems manager.

"If a manager doesn't have his leadership skills working right, if he hasn't found tasks for his people that allow for a little diversity, he may lose them," explains Robert Hammond, a high-tech headhunter based in the Boston area.

Gabel is a free-lance writer based in Northport, N.Y.

When Hammond or others in his profession call, information systems staffers may listen and then leave for better opportunities. Hammond says they are listening more and more these days.

Strange as it may sound, companies such as Borg-Warner Automotive, Inc. and Pennwalt Corp. say that the way they keep their valued IS people from being tempted by those in Hammond's profession is by increasing their value.

"We haven't had the need since the early '70s to go outside and recruit data processing management," says Vito Battaglia, the manager of materials and information services at Borg-Warner's Bellwood and Frankfort, Ill., plants.

While competitive salaries and a good management style are certainly contributing factors, Battaglia says the environment and the challenge of the job are what keep people in his company. IS personnel are encouraged to venture into the business units to learn about the functions behind the systems, he points out.

"We allow people to progress at their own pace," he says, "but we are aggressive in encouraging them to do so." As a result, virtually all promotions and advancements are from within the ranks.

The same homegrown philosophy prevails at Philadelphia-based Pennwalt, where finding personnel who can blend their technological skills with the company's business plan is crucial, notes Robert M. Rubin, vice-president of management information services. The job skills required today do not make qualified personnel tougher to find — nor are they harder to replace, according to Rubin.

"As you improve communications among your employees, cross-train them; your base of qualified applicants broadens," he says.

Rubin integrates his personnel plans into the organization's project plans and integrates the firm's overall objectives into the corporate plans. Say, for example, the corporate goal of your vitamin pill company is to permit your customers to fill their orders more quickly. To that end, the business plan calls for integrating manufacturing into the ordering system. Now that you know what the goal of the business is, you can develop the personnel plans needed to meet that goal.

> WHILE competitive salaries and a good management style are contributing factors, the environment and the challenge of the job are what keep people in a company.

Pennwalt scrutinizes its business plan annually. After its completion, Rubin devises his personnel plans. Trying to suit the employee to the project and vice versa, Rubin spends much of his time juxtaposing an employee's skill level with his request for a special project assignment, his career path options and so on.

"If an individual needs to strengthen some skill area, or if he has a goal for his advancement, then his managers have to ask, 'How does this particular plan [for some activity of the MIS organization] work with this individual?' " Rubin says.

Easing the planning task

Such a strategy eases what could otherwise be the burdensome task of succession planning. When key people leave Pennwalt, the vacated position is reevaluated in terms of its continued contribution to the organization's goals and what person would be best qualified to fill the position.

"We have contingency plans in place [for personnel vacancies], and they are reviewed at two levels above the position," Rubin says. "We look at the job description and at plans for the company. I have replacements identified, but I would still rethink the goals of the organization and discuss it one level up. I would make sure of the direction in which the organization is going and that the new person supports the business plan."

Planning at that level of detail is a rarity. It is more typical for IS managers to approach succession planning as Battaglia says he does — identifying possible successors for only a few of the most crucial management-level staffers.

And, at many organizations, this succession planning does not happen at all. "I don't think most MIS executives have any [succession] plans in place," Hammond says. "They plan to call me." •

Introducing a subsystem that cuts through the brown tape.
IBM mainframe users can now compress 24 reels of data onto one 8mm cassette.
It's called the 6800 Series Cartridge Tape Drive with the F1011 Data Compression Feature. Using IBM's SNA compression algorithm, the F1011 enables you to put a colossal 4.5 gigabytes onto one compact 8mm cartridge. Without operator intervention.
What's more, a fully configured 6860 tape subsystem features up to 7 cassette drives, which essentially replaces 196 reels. Goodbye stuffed storage rooms. Goodbye downloading monotony.
Of course, the IPL 6800 Series F1011 Feature uses no more of your system's resources than a normal tape drive operation. And as with all IPL products, the 6800 connects directly to your IBM system. There's no need for hardware or software alterations.
So if you're looking for a way to cut through the problems associated with reel-to-reel backup and storage, consider the IPL 6800 series. It's an innovation that turns a reel hassle into a real pleasure.
Call IPL today at 1-800-338-8ipl, in MA (617) 890-6620. Or contact us at 360 Second Avenue, Waltham, MA 02154.
ipl systems, inc.
IBM and AS/400 are registered trademarks of International Business Machines Corporation.

Tandy® Computers: The broadest line of PCs in America.

The Tandy 5000 MC

Our most powerful 386™ based computer ...made in America.

The Tandy 5000 MC Professional System is pure performance, from the Intel® 80386 processor operating at 20 MHz to the fast memory with cache controller that provides rapid access to your data.

With the 5000 MC, you have the high-performance platform needed to take full advantage of industry-standard MS-DOS® applications, powerful new MS® OS/2 programs or multiuser SCO™ XENIX® software.

Operating at 20 MHz, the 5000 MC cuts through the big jobs like database management, large spreadsheets and sophisticated graphics. And with its IBM® Micro-Channel compatible architecture, the Tandy 5000 MC is the ideal high-end PC workstation.

The system architecture also provides high performance in data-transfer rates when the 5000 MC is configured within a 3Com® work-group or multiuser environment.

There's nothing else like it. Compare the 5000 MC to any other 386-based system. The 5000 MC's technology, performance and price all add up to an unsurpassed value.

The Tandy 5000 MC is the new alternative in personal computing. From the best-selling family of PC Compatibles in America.

Send me a 1989 RSC-20 computer catalog.

Mail to: Radio Shack, Dept. 89-A-774
300 One Tandy Center, Fort Worth, TX 76102

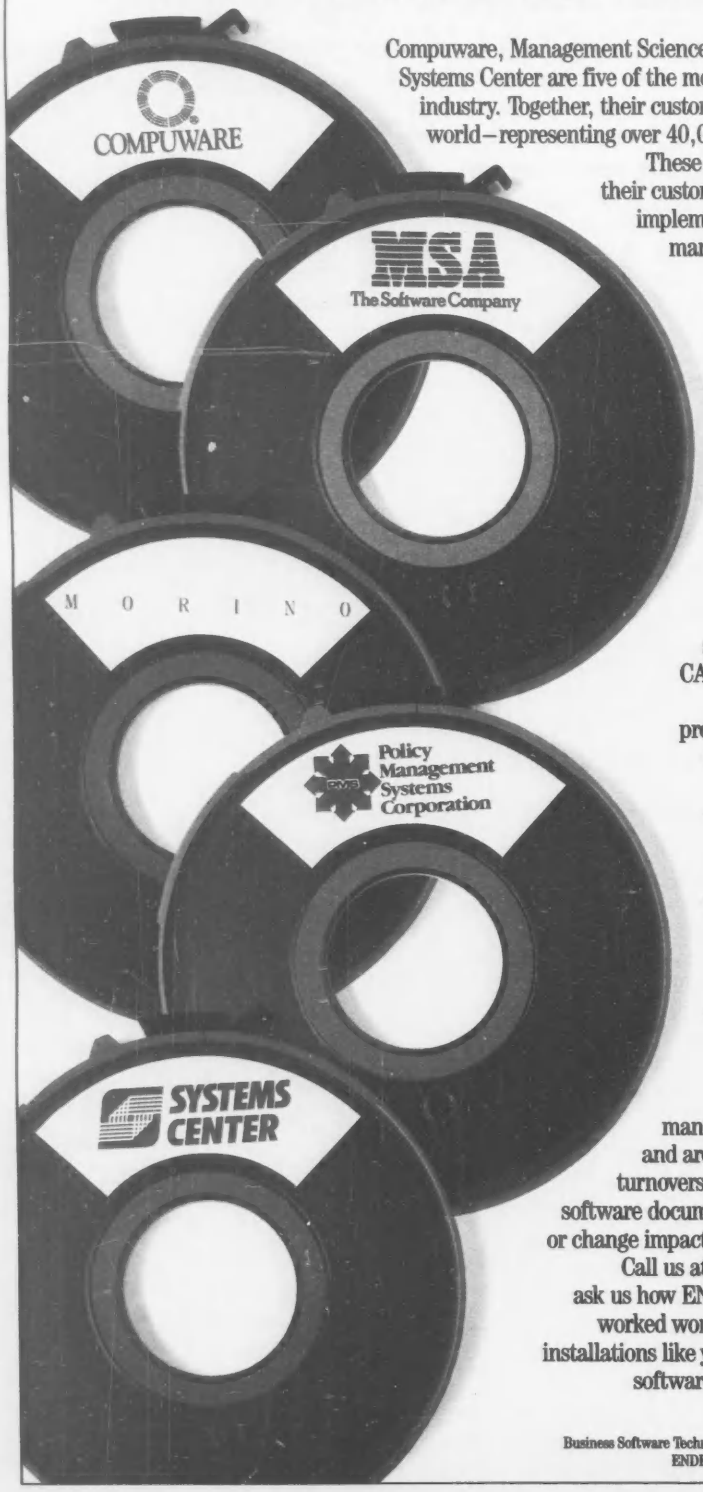
Name _____
Company _____
Address _____
City _____ State _____
ZIP _____ Phone _____

Tandy Computers: Because there is no better value.™

Intel/Reg. TM and 386/TM Intel Corp. IBM/Reg. TM and Micro Channel/TM IBM Corp. MS, MS-DOS and XENIX/Reg. TM Microsoft Corp. SCO/TM The Santa Cruz Operation. 3Com/Reg. TM 3Com Corp.

Radio Shack®
COMPUTER CENTERS
A DIVISION OF TANDY CORPORATION

The World's Most Successful Software Companies Are Sold On Software Management.



Compuware, Management Science America, Morino, Policy Management Systems and Systems Center are five of the most successful and respected names in the software industry. Together, their customer bases include almost every IBM site around the world—representing over 40,000 installed mainframe products.

These companies have all taken yet another step to provide their customers with the highest quality software. They are implementing the industry's only automated software management system—ENDEVOR.®

Using ENDEVOR, these vendors are able to manage software development and distribution within a unified environment. ENDEVOR automatically tracks every component of a software system from the time it's designed through testing and release. The results—shorter development cycles, fully reliable systems, on-time delivery to users and a more sophisticated approach to customer support.

Now you can bring all the benefits of the ENDEVOR Software Management System to your organization. With ENDEVOR, you can manage the creation, evolution, distribution and operation of your vendor-supplied and internally developed software—automatically. Whether it's traditional, 4GL, CASE or DBMS based.

The ENDEVOR Software Management System provides:

- Inventory and library management for classifying and tracking software components
- Change control that produces audit trails, source-to-executable links, and ensures standards enforcement
- Configuration management that automatically captures application interdependencies for point-in-time recreation and change impact analysis
- Release management that automatically controls the distribution of applications from test to production and to remote sites

If you're concerned about automating the management of your organization's application systems and are interested in improving the quality of production turnovers, software distribution, vendor application updates, software documentation, application stability, change implementation or change impact analysis, follow these software industry leaders.

Call us at (508) 870-1900 and ask us how ENDEVOR has already worked wonders at over 200 top installations like yours, and at the top software firms in the world.

BST

The Software Management Experts

Business Software Technology, Inc., Westboro Executive Park, 114 Turnpike Road, Westborough, MA 01581-9990
ENDEVOR is a registered trademark of Business Software Technology, Inc.

Striving for Unix security

Can IS protect the operating system or are its back doors too easily opened?

BY SANFORD SHERIZEN and FRED ENGEL

Last November's well-publicized worm attack struck more than Internet's Unix-based electronic mail system. The operating system and AT&T, its major developer, are also suffering from the impact. Other potential victims may be corporations and governments that have accepted Unix for its functionality and portability.

Unix has a reputation for being insecure. But is it inherently insecure? The question has enormous economic, political and technological sensitivity, but it and others must be answered.

The facts are that Unix's security depends on the version of the operating system being used, what the systems administrator has established as controls and what pressures for security improvements develop from the government, corporations and even AT&T.

What are the security problems associated with using the Unix operating system? How can IS best safeguard information running on Unix-based systems? What specific approaches to improving the security of Unix systems will be effective?

Unix popularity

Secure or not, there is no doubt that Unix is popular. The results of a recent survey of Unix users [*CW Focus on Integration*, Feb. 6] indicate that the reasons for Unix's growing popularity among users range from its portability and cost-effectiveness to its proven success in other organizations. Certain companies have little choice in whether to select Unix, because the software programs best suited for their specific needs are often Unix-based.

According to the survey, the biggest barrier to increasing Unix usage is the lack of trained technical expertise, the lack of compatibility and the lack of application software. Framingham, Mass.-based market research firm International Data Corp. has cited the lack of proven commercial and application software performance and the standards confusion as also working against Unix.

Interestingly, security was not mentioned once in the survey results, even though the questions were asked in December, during the height of the publicity surrounding the Internet virus attack. Yet security obviously should be a concern to the more than two-thirds of the respondents who indicated that they were using communications links between Unix and non-Unix systems for file transfer, terminal emulation, Transmission Control Protocol/Internet Protocol and E-mail.

Unix's popularity is partly because of the variety of Unix-based products out today. But because of the independent development work that has been done on Unix, the user is often faced with the fact that one Unix product is not always the same as another. In reality, there are a number of Unix versions that share only certain features and security vulnerabilities.

Unix's ready availability and portability have caused it to be the operating system of choice for both academicians and new companies developing computer systems. Vendors that use it as the operating system for a hardware platform tailor Unix to suit their own needs. Usually this tailoring occurs inside the kernel.

What is Unix, really?

Unix is composed of a set of tools and applications that run on top of a base, or kernel, that handles the low-level functions. The tailoring inside the kernel would not be readily visible to users even though it may be extensive.

For example, Unix is notorious for having a file system that is hard to repair and maintain. Thus, some vendors completely rewrite the file system internals in hope of improving their market edge and the stability of their system. While that vendor's system may be better, the result is that Unix often becomes a label on a set of services that appear to be the same to the user but are in fact very different inside.

The University of California

BEATTA SZPURA

Sherizen is president of Data Security Systems, Inc., an information security consultancy in Natick, Mass. Engel is vice-president of engineering at Technology Concepts, Inc., a wholly owned subsidiary of Bell Atlantic Corp. that specializes in network management services and products and is based in Sudbury, Mass.

• Systems administrators must take the reins

• Watch out for those superusers

• Unix security — a contradiction in terms?

at Berkeley has become the center for much of the academic development that is now the basis for one of the two major versions of Unix available in the market — Unix Version 4.2. AT&T's Unix System V, whose latest release — Version 3.2, available since last fall — contains major improvements in security.

The Berkeley and AT&T versions are similar in some ways, but they are different enough to cause confusion. While many of the basic tools are the same, there are enough significant differences to warrant a partitioning of the market. Some vendors have chosen System V, and others have chosen 4.2. Not all of the applications running on one system run on the other.

The industry has recognized these problems and has, for this and other reasons, tried to organize a "standard" Unix. There are competing organizations trying to create the standard Unix, including the Open Software Foundation (OSF), Unix International, Inc., the Institute of Electrical and Electronics Engineers (IEEE) in association with the National Institute of Standards and Technology (NIST) and X/Open Consortium Ltd. The hope is that standardization will help make the operating system more consistent and thus more secure.

As the standardization and security certification efforts heighten, more and more inspection of the development process and the structure of the actual code will be required. So far, the lack of development controls has created a potential for undesirable code to reside within the system and to be difficult to find.

But these weaknesses may also portend Unix's greatest strength: The operating system's very openness and the scrutiny devoted to it will make it difficult for the bugs to remain in place forever. Since no single vendor has control over Unix, no single vendor can control or cover up the problems. Over the next few years, most of the unknowns in Unix hopefully will be understood and repaired.

Unix insecurity

The fact remains that Unix does have many security vulnerabilities that are well known to computer and network managers. These weaknesses are also well known to hackers, computer hobbyists and others who may be interested in testing their technological skills. They have easy access to published articles, Unix documentation and bulletin-board information sources on back doors into Unix.

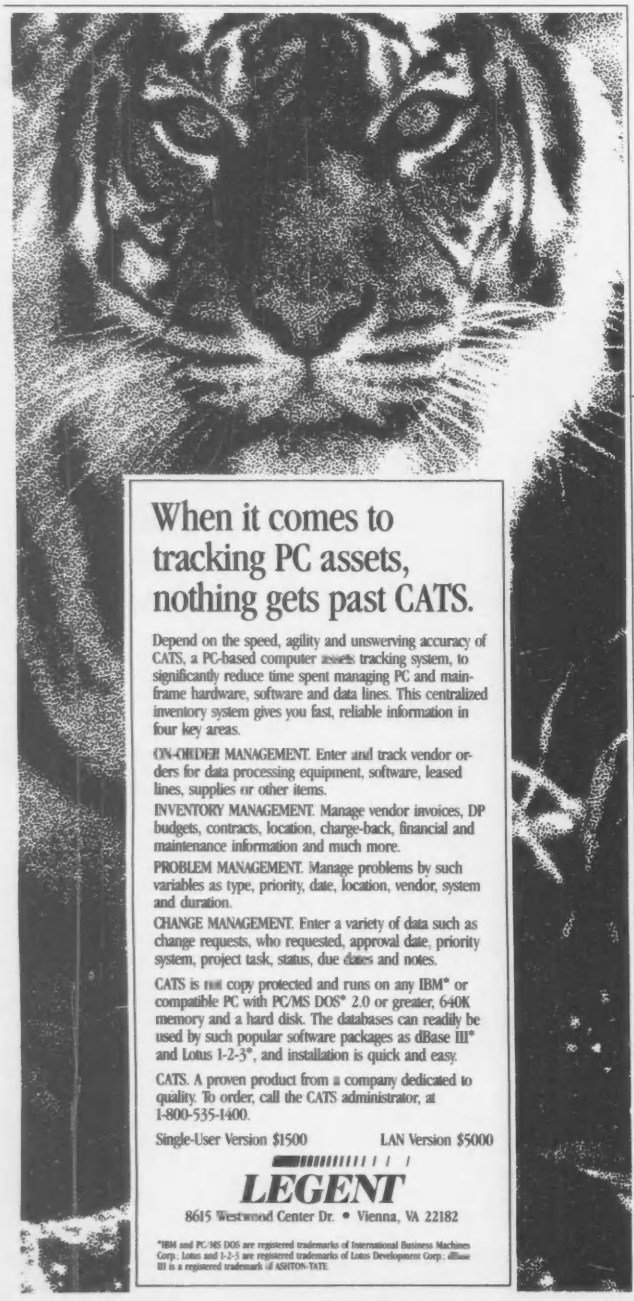
The Unix security problem is composed of Unix-specific and non-Unix-specific elements. Unix-specific security risks are those that are inherent in the architecture of the operating system and therefore are not likely to disappear from most existing Unix systems in the near future. Included in this classification are the "superuser" user category, which provides universal access, and the "setuid" and "setgid" systems calls.

Non-Unix-specific security risks are those associated with the normal usage of computer systems and software. On a Unix system, these can lead to great damage because of how Unix functions. Included in this category are the risks in having software contain back doors or Trojan horses as well as unsecured physical locations where networks, computer rooms, terminals, tapes and disks can be accessed by unauthorized persons.

Unix-specific issues

The inherent operating qualities of Unix create a vulnerability that opens the doors to some security attacks. For the Unix-proficient, these structures can be summarized in the superuser, setuid and setgid functions. A user who becomes a superuser is able to remove all the security barriers that exist within Unix. Thus, one problem deals with keeping unauthorized users from becoming superusers. This problem is common to a variety of Unix systems and has a rather standard set of administrative solutions.

Many of the tools and utilities in Unix need to change modes into superuser for a brief period of time in order to reach some service that the user has requested. This is done through the use of the setuid and setgid system calls. When properly executed, these place the program executing them into superuser status. In most cases, such programs are well debugged and there is little risk of decreasing the stability of the system. However, the existence of a mechanism that allows the granting of unlimited privileges to some programs can easily be exploited. The exploitation can occur through poor design or through maliciousness. There are many documented cases of poorly



When it comes to tracking PC assets, nothing gets past CATS.

Depend on the speed, agility and unswerving accuracy of CATS, a PC-based computer assets tracking system, to significantly reduce time spent managing PC and mainframe hardware, software and data lines. This centralized inventory system gives you fast, reliable information in four key areas.

ON-ORDER MANAGEMENT. Enter and track vendor orders for data processing equipment, software, leased lines, supplies or other items.

INVENTORY MANAGEMENT. Manage vendor invoices, DP budgets, contracts, location, charge-back, financial and maintenance information and much more.

PROBLEM MANAGEMENT. Manage problems by such variables as type, priority, date, location, vendor, system and duration.

CHANGE MANAGEMENT. Enter a variety of data such as change requests, who requested, approval date, priority system, project task, status, due dates and notes.

CATS is not copy protected and runs on any IBM* or compatible PC with PC/MS DOS* 2.0 or greater, 640K memory and a hard disk. The databases can readily be used by such popular software packages as dBase III* and Lotus 1-2-3*, and installation is quick and easy.

CATS. A proven product from a company dedicated to quality. To order, call the CATS administrator, at 1-800-535-1400.

Single-User Version $1500 LAN Version $5000

LEGENT

8615 Westwood Center Dr. • Vienna, VA 22182

*IBM and PC/MS DOS are registered trademarks of International Business Machines Corp.; Lotus and 1-2-3 are registered trademarks of Lotus Development Corp.; dBase III is a registered trademark of ASHTON-TATE.

3287 Desktop Printing From Your Mainframe

...With LaserJet Power

Now you can create great looking LaserJet documents directly from your mainframe with the *NEWPORT/Coax* printer adapter. Merge on-line text, graphics, fonts and letterhead to give your reports and printouts the professional appearance they deserve.

NEWPORT fits right into the optional I/O slot in the LaserJet II or IID printer. Simply attach a standard 3270 Type A coax and press the "Optional I/O" button. You're ready to print directly from your mainframe. The serial and parallel ports of the printer are left available for connection to personal computers and other devices.

NEWPORT was co-developed with Hewlett-Packard to ensure maximum compatibility. In addition to 3287 emulation, the *NEWPORT*-LaserJet combination gives you features you can't get from a 3287 printer.

NEWPORT is completely host configurable and compatible with your IBM supplied host software. Graphics are available through GDDM, user-developed programs, and a variety of third party host application software including TELLAGRAF, MD-LASER, MD-GRAFTEXT and SAS/Graph.

For Your Evaluation Unit

Call 1-800-633-9299

During Business Hours, 8-5 CST

Andrew will provide a *NEWPORT* to qualified buyers for a 30 day evaluation. At the end of the evaluation period, you may purchase the *NEWPORT* for $895, or return the unit at no charge.

NEWPORT was designed by Local Data. With more than a decade of experience with IBM interfaces and protocols, Local Data is now an Andrew Company dedicated to providing leading edge communications technology.

ANDREW

Network Products

Midwest Operations Center, CW-NEWPORT
4650 N. Port Washington Rd., Milwaukee, WI 53212

© 1989 Andrew Corporation
LaserJet is a registered trademark of Hewlett-Packard Co.

Get A Bird's-Eye View.

Want the complete picture on the world's most advanced relational DBMS? Just return this card for more information, or to talk with a Cincom representative. You'll find it easy to see just how much SUPRA® Version 2 can do.

☐ Send more information on SUPRA Version 2.
☐ Have a Cincom representative contact me.
☐ Keep me informed on upcoming educational seminars.

Name: _____ Title: _____

Company: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone: (_____) _____

© 1989 Cincom Systems, Inc.

CINCOM
The Better The Solution, The Better The Value.

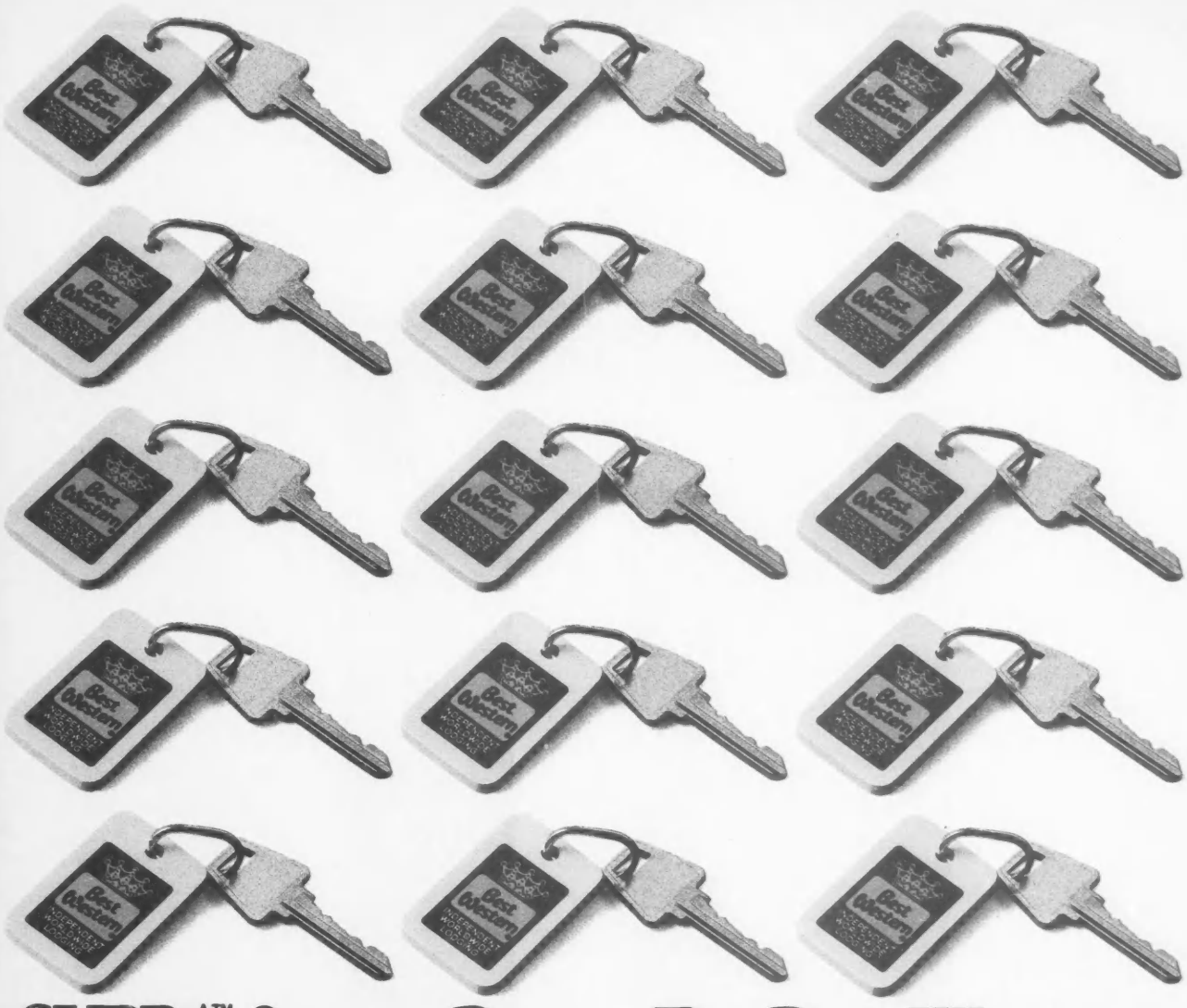
NO POSTAGE
NECESSARY IF
MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 12787 CINCINNATI, OH 45211

POSTAGE WILL BE PAID BY ADDRESSEE

CINCOM
World Headquarters
2300 Montana Avenue
P.O. Box 11189
Cincinnati, OH 45211

Attn: Field Services Department



SUPRA™ Opens Doors For Best Western.

PROBLEM: *How to easily access and update large volumes of corporate information vital for strengthening image and facilitating expansion*

CINCOM SOLVED IT: *With SUPRA Advanced Relational DBMS and MANTIS, a powerful application development tool*

Tracking and managing information for 3,300 hotels in more than 30 countries around the world is enough to give any MIS manager some sleepless nights. But, thanks to the SUPRA™ Advanced Relational DBMS from Cincom®, Best Western's Robert Seate (along with member hoteliers and guests) can rest assured things are running smoothly.

Mr. Robert C. Seate
Manager, Management Information Systems
Best Western International, Inc.

"With SUPRA, we really have the best of both worlds," explains Seate. "We get the advantages of a relational environment and, at the same time, get a system that performs very well in a large volume production environment."

SUPRA's superior performance lets the world's largest hotel chain access and update the marketing data as well as the property and travel publications essential to support and promote each hotel. SUPRA also works in concert with MANTIS®, a flexible application development tool in the CASE ENVIRONMENT™, to drive multiple programs designed to monitor and upgrade quality standards throughout the Best Western organization. "When you increase the value of the chain, people want to become a part of it," Seate explained.

"SUPRA and all the Cincom products work together to help us meet our corporate expansion and quality goals," Seate points out. "It's a set of tools that is very flexible, very easy to use and learn, and very capable of developing and supporting a wide variety of applications."

As for SUPRA's reliability, Seate has no reservations. "Let's put it this way," he says, "we're running our payroll on it. We'd be crazy to do that if we didn't have a high degree of confidence in the system."

If you're looking for a relational data base with IBM and VAX compatibility, high performance and reliability, plus the option of a flexible application development tool, it's time you checked into SUPRA and MANTIS.

Call us today for more product and customer success information, or write our Marketing Service Department, Cincom World Headquarters, 2300 Montana Avenue, Cincinnati, OH 45211.

1-800-543-3010
In Ohio, 513-661-6000
In Canada, 1-800-387-5914

CINCOM®
The Better The Solution, The Better The Value.℠

© 1988, Cincom Systems, Inc.
© 1988 Cincom Systems, Inc. IBM is a registered trademark of International Business Machines Corporation. VAX is a trademark of Digital Equipment Corporation.

debugged and/or maliciously designed programs being run in this mode and creating inadvertent or intentional damage.

In one case, an administrator wrote a program that, among other things, allowed users to store information in certain privileged directories. The program used a file, itself in a privileged directory, to control the directories that were to be written into. Unfortunately, the file contained an entry for its own directory. A user saw this and rewrote the entire file, giving himself the ability to write into any directory in the system. Were he malicious, he could easily have placed viruses, Trojan horses, back doors or other programs in any system or user directory.

Thus, any program capable of reaching superuser status needs to be carefully managed and certified. In an environment that is open and free, what often happens instead is that software can be passed from one machine to another without proper certification. In one experiment, a researcher gave one such maliciously designed program to a nonprivileged Unix installation user and observed its migration to the status of a privileged program within a few days.

Software travels quickly, and seemingly useful software travels even more quickly. Thus, while the mechanism within Unix can be safeguarded, it is more difficult to ensure that the people around Unix will act with the proper caution.

Non-Unix-specific issues

This scenario leads to the non-Unix-related aspects of security. There are two popular methods for attacking a computer system — a Trojan horse and a back door. These two types of attacks are used in many types of systems, not just Unix systems. A Trojan horse is a program that contains code whose instruction is to do some kind of damage.

For all practical purposes, the program provides some useful service. However, it also contains logic that will do something other than what the program was intended to do. These Trojan horse programs have caused a variety of damage, ranging from corrupting files to surreptitiously sending files across a network to someone who otherwise would not have access to the transferred data.

A back door is similar to a Trojan horse except that it is a piece of code that is left behind to be triggered by an outside agent. The person who inserted the back door activates the code. Once activated, it responds to the commands of the intruder. The Internet virus in the Unix E-mail system allegedly came in through such a back door.

In Unix, these and similar attacks pose special dangers because, by judicious manipulation, the attacker can become a superuser and gain access to anything in the machine. These unsophisticated computer attacks can be very effective in Unix, more so than in some other systems.

Other openings

In addition to externally produced Trojan horses and back doors, two mechanisms within Unix are important to security. When users enter a command in Unix, the system searches for the program named by that command along a search list of names defined by the variable "PATH." If this search list is altered in some fashion, everyday users can be invoking Trojan horse programs that are disguised to look like standard programs. In general, PATH is set up to search through a standard set of directories for the program. If PATH is altered to search through a directory that has not been allocated privileged status and does not belong to the user typing commands, then any program placed in that directory could be chosen before the standard program. Thus, one alteration to PATH can lead to an endless set of bogus programs.

A security audit product currently on the market uses such a technique to determine if the security of the system being audited has been breached. The security audit program masquerades as the common utility "ls." When "ls" is invoked, a security audit is done in addition to the normal work "ls" usually performs. While this use of the mechanism is for security reasons, other uses may not be for that purpose. Ensuring that

T1

The networking T1 from the #1 name in network solutions.

Meet Omnimux® 8000. The newest addition to the most complete T1 product line in the industry...a range of solutions that covers everything from channel banks and DACS to the most sophisticated, multi-nodal, networking T1 muxes.

Built with over 30 years of networking knowledge, the mid-range 8000 puts our experience to work for you. To make T1 more like you'd like it to be. More affordable. More reliable. More manageable.

More affordable, because **modular architecture** lets you buy only the features you need. The result: a customized T1 solution just right for your network. And for your budget.

More reliable, because **redundant integral CSUs** — both primary and hot back-up spare for every T1 line — ensure maximum uptime. You don't waste time and money replacing CSUs. You won't lose your diagnostic database either. And you can tell the difference between T1 line and CSU problems faster and easier, too.

More manageable, because instead of the risk of a single point of failure, you get **single point control** of both CSUs and T1 muxes. One menu-driven, integral network management system gives you comprehensive tools to ensure maximum network availability.

Want more? How about bandwidth contention. Bypass, automatic alternate routing, and drop/insert. Versatile data and voice support. And still more. All at a price you're sure to like.

PATH is not altered can control accidental triggering of malicious programs.

The second major security concern found within Unix is the connection of the system to the network. Unix systems, by and large, tend to be connected to networks. However, besides their valuable use as user and data connectors, networks can also be thought of as vehicles for bringing in uncertified software and sending out private data.

Unix has many tools that will allow it to become part of the growing community of network users within the industry. The Unix-to-Unix Copy Program is one such mechanism that allows the system to send and receive mail and script files from users on other systems.

In addition, network file systems represent another threat by requiring users to reach across the network for their file systems. This intimate link between users and their file systems can potentially be more easily intercepted than when this communication takes place within a single internal system. The network in effect puts the Unix system out in the open, where it may be more vulnerable to access attempts.

Network connectivity also creates a need for adequate physical security. Many precautions must be taken to provide enough security for a Unix system just as for any other system. While Unix's physical security requirements are no different from any other system, the availability of ways to connect to

Continued on page 92

Hindsight

The history of Unix has had a significant impact on its current security problems.

AT&T created the operating system for internal use. Unix was meant to be open and accessible to the user and to the systems developer. AT&T has continued to evolve its own version of Unix.

In the early 1970s, after AT&T released Unix to the world at large, the university community embraced it as the best tool for systems and software experimentation. In the academic environment, Unix became the primary vehicle for development.

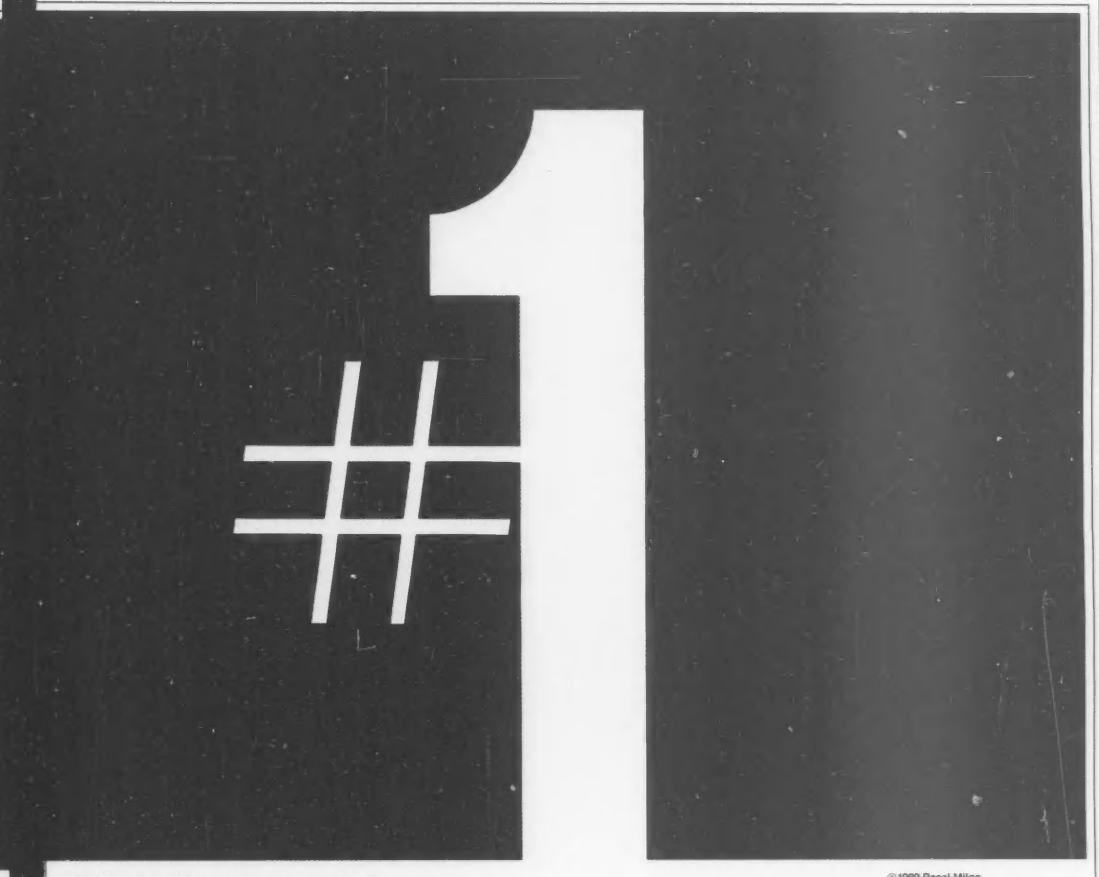
Students cut their computing teeth on Unix and became aware of its functions and vulnerabilities. In fact, as an undergraduate at Harvard University, Robert T. Morris Jr., the person accused of orchestrating the Internet virus attack, was viewed by Harvard's computer staff as its resident Unix expert.

Hackers and serious researchers — sometimes the same person — spent years making Unix a flexible tool with countless utilities. Unix became part of the network of academic and government computers that provided much of the technology now being deployed in industry. Unix was an open structure within a single site as well as open nationwide when accessed through a network.

The people contributing code to Unix and its tools were from a variety of organizations around the country. They did not share a single set of management goals but had a variety of technology-extending goals. Some raised security issues, but these often had to compete with productivity concerns. The result was that security options were available with defaults open to security administrator decisions. Value was something that worked to improve development and experimentation.

Current standards work is expected to thwart some of the security problems caused by the divergent goals of those who use and develop Unix today.

SANFORD SHERIZEN
and FRED ENGEL



©1989 Racal-Milgo

We stand on our record, but never rest on our laurels.

We're working to add leadership in T1 to our history of achievement. And if our track record is any guide, we're the networking company you can count on for quality, reliability, and stability.

Our full T1 line is just part of a comprehensive range of network components that encompasses modems, DSUs, fiberoptic products, statistical multiplexers, data encryption products, X.25 systems, and network management systems.

What's more, we go far beyond hardware and software to provide total customer support in 82 countries...before, during, and after the sale. We can help you plan, design, implement, manage, and maintain any size network, anywhere in the world.

You don't have to take our word for it. For example, Datapro* said, "...a full-service systems supplier...solid products that perform as promised." And IDC** found Racal-Milgo holds the largest share of both domestic and international markets for network management systems. You can expect the same commitment and long-term performance from Omnimux 8000.

For more information, call toll-free 1-800-327-4440 (in Florida, 1-305-476-4811). Federal Government users, 1-800-327-7909 (in Florida, 1-305-476-4452).

Omnimux 8000. Now, that's more like it. But then, that's Racal-Milgo. Reaching beyond today's standards.

*Datapro, *User Ratings of Network Management Systems*, September, 1988.
**International Data Corporation (IDC), *Quantitative Analysis of the Network Management Market*, October, 1988.

Racal-Milgo®
RACAL

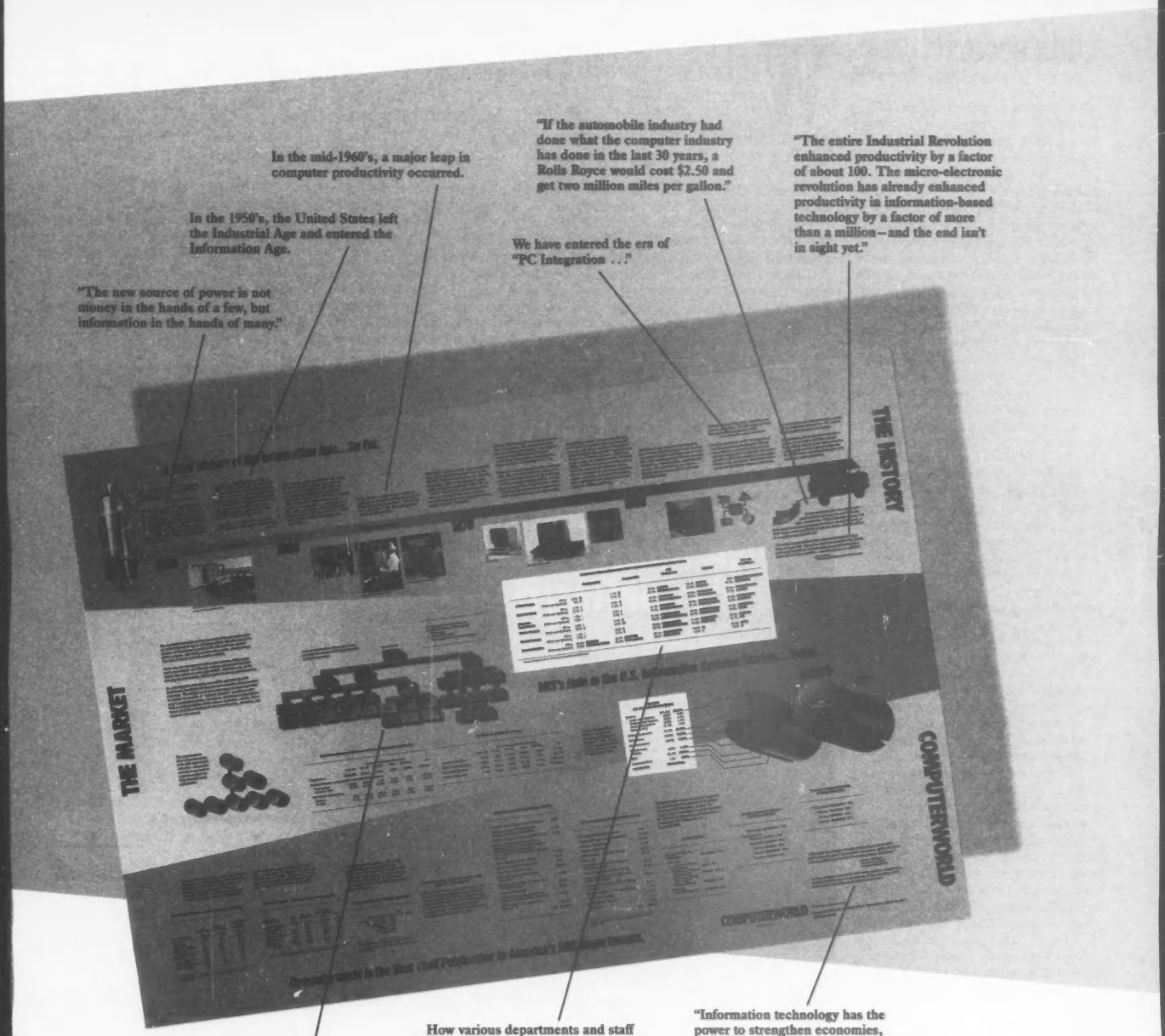
We're covering a revolution!

The invention and spread of computers in the last three decades isn't just a new technology finding its way into society. It's the start of a revolution in the way mankind operates: the end of the Industrial Age and the beginning of the Information Age.

For more than two decades, *Computerworld* has been the newspaper of record for the information systems professionals who are right at the heart of this revolution: the managers, executives and staffers responsible for the implementation of information systems at America's medium to large organizations.

As technology has changed from mainframe to mini to micro – and as low-cost computer-to-computer communications has become a reality, these professionals have adopted the new technologies in a never-ending effort to keep their corporate information systems current. And they have relied on *Computerworld* to keep them abreast of the incredibly rapid changes that have characterized this business since the beginning. Today, *Computerworld* has a total audience of more than 600,000 computer professionals (ABC-audited). And it is truly the newspaper of record for information systems management.

To put everything in perspective, we have taken a brief look at where this young industry has been and how it is doing right now. It's all shown in the poster pictured here. Life size, it's 26″ by 38″, and it's full of interesting information on the new Information Age.


"If the automobile industry had done what the computer industry has done in the last 30 years, a Rolls Royce would cost $2.50 and get two million miles per gallon."
"The entire Industrial Revolution enhanced productivity by a factor of about 100. The micro-electronic revolution has already enhanced productivity in information-based technology by a factor of more than a million—and the end isn't in sight yet."
In the mid-1960's, a major leap in computer productivity occurred.
In the 1950's, the United States left the Industrial Age and entered the Information Age.
We have entered the era of "PC Integration . . ."
"The new source of power is not money in the hands of a few, but information in the hands of many."
THE HISTORY
THE MARKET
COMPUTERWORLD
The modern MIS Department adjusts to keep up with changing technology.
How various departments and staff get involved in the information system decision-making process in America's medium to large organizations.
"Information technology has the power to strengthen economies, tighten the bond between nations and improve the quality of life for individuals."

This poster gives you a great opportunity to stop for a second and look at the forest instead of the trees. And if you're involved in marketing or promoting computer products or services, we'll be happy to give you a free copy for your wall.

Just contact Libby Levinson at (508) 879-0700.

The Newspaper of Record for Information Systems Management

An IDG Communications Publication

Unix security

CONTINUED FROM PAGE 89

other systems over the network, local or worldwide, makes physical security harder to achieve than with other systems of lesser capability.

Securing Unix

While it may appear that Unix users are without protection, that is not the case at all. While Unix is not as strong as many in information security would like, newer versions of Unix have improved security, and additional tools are available to make Unix more secure. There are also future developments that will increase the ease of security management.

Systems using Unix can be better protected. Yet, they are only as secure as their systems administrators allow them to be (see story next page). The security of any operating system can be attributed directly to how well that system has been administratively reviewed and secured.

IS must set up accounts, create passwords, add new software to the systems and give access rights to various pieces of data. The dynamics of administering a system dictate ongoing change in the access and relationship of the various accounts, files and programs. Without careful and deliberate execution, the best automated mechanisms can be subverted.

Beyond the system administrators, the vendors of systems with known weaknesses also have responsibilities to pay more attention to system security. They need to provide information and pass on timely patches to their customers when holes are discovered in their systems. They will have to work to increase their systems' security to stem lost sales opportunities as well as to prevent potential lawsuits, which, even if unsuccessful, can become public relations nightmares.

While there may not always be enough pressure put on vendors solely by corporations requiring a secure Unix, the federal government has been quite active in seeking ways to induce security within the vendor community. Over the next few years, the government will strengthen the security requirements of all the systems — Unix or otherwise — that it procures, and as commercial vendors comply with these regulations, these products will become available to the private sector. Thus, systems purchased in 1992 should, in all likelihood, have significant security improvements over today's systems. In any case, the government-vendor cooperative relationship can be examined in a number of ways.

The current conflict over standards directly affects Unix security, and that is what links the vendor community with the federal government, which holds a major stake in Unix security. (The government purchased $1.93 billion worth of Unix systems in 1988, with approximately two-thirds of that earmarked for the defense agency.) According to recent published reports, U.S. Department of Defense officials are so concerned about the security aspects of both AT&T's System V and the OSF's Unix offering that they may try to force the two groups together to come up with an acceptable operating system.

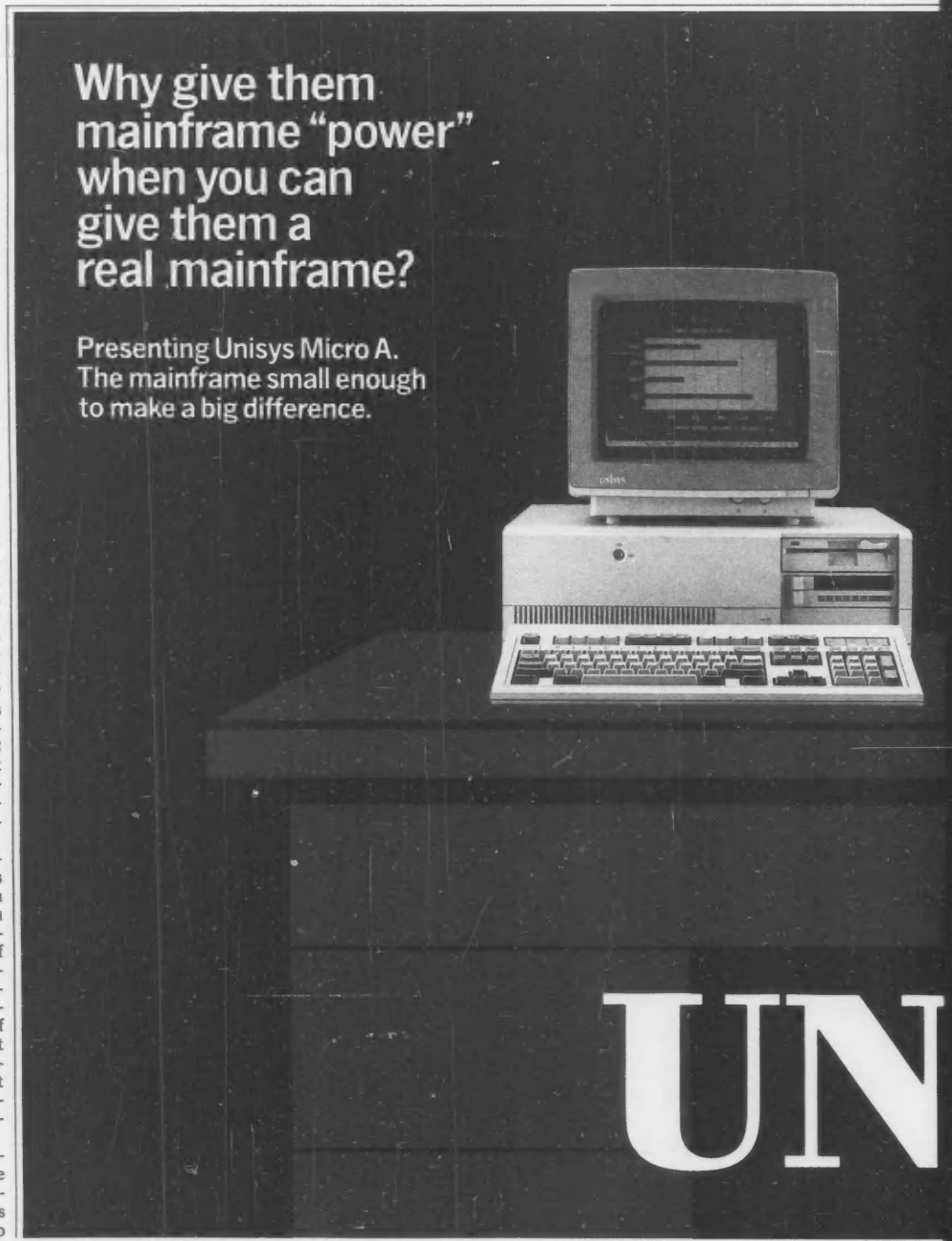
Recently, in response to the latest outbreak of computer viruses, the Defense Department formed the Computer Emergency Response Team (CERT). CERT is a group of experts who will be available to

WHILE UNIX IS NOT as strong as many in information security would like, newer versions of Unix have improved security, and additional tools are available to make Unix more secure.

fly to federal sites around the nation to assist in fighting viruses. Last December, /Usr/Group, the Unix trade association, applauded the establishment of CERT and suggested that the computer industry supplement these government efforts by agreeing on standard procedures for dealing with emergencies such as viruses. The user group recommended considering the best way to disseminate information when computer networks are artificially congested through viruses or other exceptional network problems.

The government also supports Unix security improvements through its testing procedures. In late 1986, the National Security Agency's National Computer Security Center studied a prototype secure system derived from AT&T's Unix System V, Release 2. The study assigned that system with the B2-level of assurance requirements defined in the Trusted Computer System Evaluation Criteria (TCSEC). The study concluded that it is possible to build a B2, B3 or A1 system with an interface very much like that of Unix. However, it also concluded that major problems exist with today's common Unix implementations.

Fortunately, vendors have started to respond to the government's security concerns. Several firms have announced secure versions of Unix to help them capture contracts with organizations such as aerospace companies. The Department of Defense issued Directive 5200.28 last year, requiring that by 1992 virtually all multiuser computer systems meet at least the C2 level of the TCSEC. This level


Why give them mainframe "power" when you can give them a real mainframe?
Presenting Unisys Micro A. The mainframe small enough to make a big difference.
UN

provides for need-to-know protection, audit capability and user accountability. Certain vendors have announced that they are seeking even higher levels of security. AT&T's next release of Unix is expected to have C2-level security features.

In addition, the Department of Commerce's NIST, which develops standards for the civilian agencies of the federal government and interfaces with the private sector, has a Unix security project. Posix is concerned with security standards efforts associated with IEEE P1003.6, which is an interface-specific standard. The objectives and scope of this effort are to establish functional interface standards consistent with but not limited by the TCSEC. Elements for Posix will include basic security mechanisms, discretionary access controls, auditability mechanisms and nondiscretionary access controls.

Without a doubt, Unix security will improve over time. How it will improve and the costs involved in increased security are less certain. Those decisions await the push of an organized IS community.

IS has a major stake in improving Unix security, but only such that the security serves other IS needs. If upgrading Unix security interferes with information flow or complicates network management, it will continue to receive insufficient attention. A balance between production and protection will have to be addressed.

IS managers have an absolute right to impress upon vendors their interest in security improvements within product lines. IS can also make it quite clear to the Unix standards groups that these organizations must agree on security as a priority area, aside from their other disagreements concerning standards.

Finally, IS can advise and work with the government to define the security needs of the private sector. Firms should get into both the definition and decision loops at this time or be prepared to stand around and complain after some very essential decisions have been made. By that time, it may be too late to do very much.

The Internet virus attack brought Unix security problems out into the open. Ironically, the attack took place while major efforts were already under way to improve the security of this operating system. Eventually, secure Unix may no longer be a contradiction in terms. •

A security checklist

There are several options that Unix systems administrators can take to secure their systems, including following simple guidelines and disallowing the use of certain passwords.

A checklist of essential Unix security activities for system administrators includes the following:

- Follow installation rules.
- Follow configuration rules.
- Enforce password lengths and require frequent password changes.
- Never leave active root or superuser status logged in on an unattended terminal.
- Limit access to privileged passwords.
- Follow vendor recommendations regarding security administration.
- If there are no vendor security recommendations, inquire why these are not available as support.
- Scrutinize and be suspicious of all software programs, especially those requiring privileges.
- Write setuid programs with caution and then limit access.
- Do not ignore physical security.

IS should also consider Unix system administration of security in light of a key ingredient in November's Internet worm program, which contained an attack mode to discover user passwords. The worm tried a number of words in attempting to break passwords. According to "The Internet Worm Program: An Analysis" — a technical report of the attack by Eugene Spafford, an assistant professor of computer science at Purdue University — some of those words were quite common, while others apparently were gathered from computer systems and collected into a mini-dictionary.

A selection of passwords, derived from the Internet worm program, should be treated as open locks that need to be excluded from use. Armed with the list, Unix system administrators should review their systems' password files to see whether any of those passwords are being used. More important, they should check to see whether the utility that sets users' passwords would ensure that new passwords would be more difficult to guess.

The list of passwords is available only to authorized systems administrators by writing Sanford Sherizen at Data Security Systems, Inc., 5 Keane Terrace, Natick, Mass. 01760, or calling 508-653-7101.

An in-depth review of Unix security is available in "Security in a Unix Environment," the proceedings of a seminar given by Hank Kluepfel, district manager of operations systems planning at Bellcore in Morristown, N.J., to the EDP Auditors Association in New York.

SANFORD SHERIZEN
and FRED ENGEL

Chances are, some of the users in your organization could use the kind of power, versatility and global access a mainframe would offer.

But *simulating* that kind of capability with typical departmental systems can give you a spaghettiware solution that creates real problems.

So we created Micro A. The first, smallest, least expensive mainframe in the world that runs the same architecture as a broad, proven mainframe family.

Micro A is simply the smallest of 16 systems in the A Series ranging in size up through the A 17 (144 times more powerful, and one of the largest mainframes made anywhere).

With the same 48-bit architecture as the rest of the family, you'll never have to worry about the costs and productivity loss of software conversion.

You can easily extend your main computing system into department levels (without asking anyone to give up their PC) and maintain a centrally controlled computing strategy. You'll simplify networking and have a single mainframe interface to manage.

See for yourself how this micro mainframe can make a big difference in your organization. *Call us for a free demonstration diskette*, more information or a live demonstration at 1-800-547-8362.

UNISYS AND YOU.
The power of ²

This is not a PC. It is a complete mainframe.

SPECIFICATIONS:	Memory: 12 MB RAM
Users: up to 16	Disk Storage: 280 MB–1.4 GB

UNISYS

Cut XENIX database development costs.

Special offer. SQL development system only $795.

Seldom has so much been available for so little.

Introducing the SQL Developer Series from Informix. Which consists of, take a deep breath, the XENIX version of INFORMIX-4GL RDS/ID (our powerful INFORMIX-4GL Rapid Development System and Interactive Debugger) plus INFORMIX-SQL (our best-selling relational database management system).

And for a limited time, you can get all that software (up to a $5540 value) for only $795.*

Develop in XENIX. Port to large systems.

Better yet, the software is as special as the offer. You see, the SQL Developer Series lets you quickly and easily develop, debug and compile your SQL application in XENIX. And because the application you develop is in p-code, it's directly portable to UNIX and a variety of networks without rewriting or recompiling.**

Clip this ad to cut your costs.

Simply put, the SQL Developer Series is the most productive, least expensive way to build SQL applications. So order yours today. Fill out the coupon portion of this ad and send it to the address below. Or call (415) 322-4100, ext. 418.

INFORMIX
#1 for good reason.

____ Please send me the SQL Developer Series for $795 (shipping included).

____ 3½" diskettes ____ 5¼" diskettes ____ Tape cartridge

Machine type _____

Name _____ Title _____ User or VAR? _____

Company _____ Address _____

City _____ State _____ Zip _____ Phone _____

Method of payment. Circle one. Check M/C VISA AMEX

Card No. _____ Exp. Date _____ Signature _____

Mail to: Informix Software, Inc., Dept. DP88, 4100 Bohannon Drive, Menlo Park, CA 94025. Prices in U.S. currency. Offer good in U.S. and Canada only.

*Offer expires June 30, 1989. Ask us about run-time licenses for UNIX, XENIX and networked DOS systems.

**Obviously, mixed 4GL/C programs or code written to take advantage of specific operating system features may need to be rewritten or recompiled.

Informix is a registered trademark of Informix Software, Inc. All other names indicated by ® or ™ are trademarks or tradenames of their respective manufacturers.
© 1989, Informix Software, Inc.

CW3/20/89

INDUSTRY INSIGHT

Nell Margolis

Traveling in vicious circles

Microsoft is a household name in the computer industry. Business Software Technology (BST) isn't one yet, but it wants to be.

Sometimes, even BST must wonder why.

If BST proves smart enough to attain the visibility it wants, the scrutiny it gets from users, investors and the press will probably force it into the foolishness that has boxed in Microsoft and would have prevented its rise if committed on the way up.

Earlier this month, microcomputer software market leader Microsoft stunned the industry with the news that delays in Microsoft Word word processing enhancements would knock the company's third-quarter revenue below projected levels. Wall Street panicked. Stock plummeted.

And, no doubt, a few folks at Lotus laughed. Last fall, product shipment delays caused Lotus, once the leader of its pack, to suffer stock decimation, press castigation and precious little sympathy from archcompetitor Microsoft.

What goes around comes around. But what's going around is insidious, and most leading high-tech companies have caught a dose of it recently. It's a strain of Vicious Circle Syndrome, and its symptoms are all too predictable.

Impressive products power a company to the front ranks of its market niche. Competition mounts. Price wars threaten. The clarion cry sounds from the increasingly sophisticated and demanding user community: "What have you done for me lately?" The press and the financial analysts take up the theme.

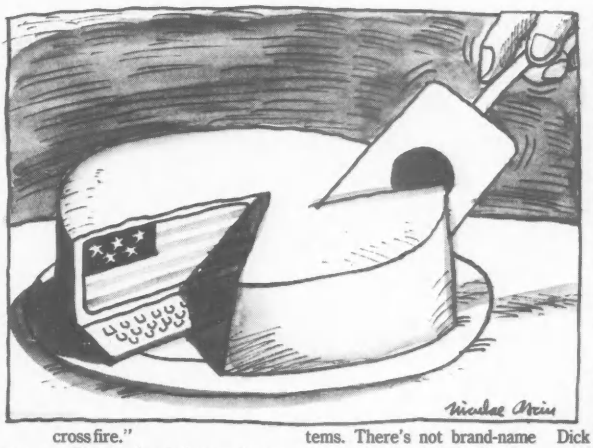
Panicked, the company rushes to announce a nifty new product. Inquiring minds want to know exactly when it will ship. Pinned, the company names a target date. In an overwhelming number of cases, the company is accurate on two out of three scores. The product is new. It's nifty. What it isn't is ready, and, what's more, odds are that it

Continued on page 98

Japanese say: Buy, buy MIS American pie

With marketing, conversion and rollout efforts, three Far East giants zero in on U.S. arena

BY HELEN PIKE
CW STAFF



Fujitsu Ltd., NEC Corp. and Hitachi Ltd. — the three key Japanese computer makers — are flexing their muscles to pick up a bigger piece of the lucrative U.S. MIS market this year. Among their efforts are the following:

- Converting U.S.-developed mainframe software to run on Japanese machines.
- Expanding production of personal computers, including Unix models.
- Rolling out a 20 billion floating-point operations per second (GFLOPS) supercomputer.
- Intensifying marketing programs in an effort to "Americanize."

The escalating rivalry among Japan's three top computer companies prompts longtime Japan watcher George Lindamood at Gartner Group, Inc. to comment that "American computer companies [could] get killed in the cross fire."

But another industry observer regards the moves by Japan's computer companies as evolutionary. "It'll be a while before they crack the Fortune 1,000 market," said Michael Geran, an analyst at Nikko Securities Co. in New York. "There's still a software lock on [most] proprietary mainframe operating systems. There's not brand-name recognition, and their distribution methods are indirect."

Nonetheless, the strong yen and high real estate costs are forcing the Japanese companies to set up plants in the U.S., said Lindamood, industry services program director at the Stamford, Conn., market research firm. Such moves not only give the companies lower cost manufacturing sites but also more goodwill in the eyes of the U.S., he said.

Japanese-owned plants are already turning out semiconductors, disk drives, personal computers, printers and private branch exchanges with the "Made in the U.S.A." label, added Lindamood, who began following Japan's growing computer efforts in 1972 for the U.S. Department of Commerce.

The stakes could get higher, judging by the ambitions of the players.

"We're scrapping for the fourth position," said Dick Miller, marketing director at NEC's Entry Systems Division in Boxboro, Mass., referring to the spot behind IBM, Apple Computer, Inc. and Compaq Computer Corp. in the ranking of U.S. PC producers. Last year, the NEC division shipped more than 100,000 IBM Personal Computer AT compatibles to

Continued on page 96

Ask CEO/founder quits to publish her story

BY J. A. SAVAGE
CW STAFF

MOUNTAIN VIEW, Calif. — Sandra L. Kurtzig, one of the few female chief executive officers in the computer industry, resigned last month from Ask Computer Systems, Inc., the company she has nurtured for 17 years, to write a book. It's about a female CEO who spent 17 years nurturing a company.

Kurtzig quit Ask, a maker of software for Hewlett-Packard Co. and Digital Equipment Corp. platforms and a value-added reseller for HP and DEC, so she could recount her story in print rather than on the lecture circuit. "People can read the book, so I don't have to travel," she said.

While some working CEOs publish books, Kurtzig felt she had to leave Ask before she could write. "I had to separate my emotional feelings [from Ask]. It's like a child — at some point you have to say the child is grown up," she said. Since the firm's maturation more than five years ago, Kurtzig said she has taken a primarily hands-off role toward the company she cofounded in the early 1970s.

Telling the story of her company is part of her contribution to society. Working at a soup kitchen is not Kurtzig's chosen brand of community service; her forte is encouraging entrepreneurship. "If I can give anything to society — a lot more than a community fund or anything like that — it would be if I can inspire five successful companies," she said.

Watching pennies

Starting Ask with no venture capital, Kurtzig became a pencil counter. "I learned from my father that you don't spend what you don't have," she explained. Thus, she encourages other entrepreneurs to start lean to survive lean times.

"There's too much venture capital in the Silicon Valley," Kurtzig said. "You've got to take risks, and if you're starting with $1 million in venture capital, there's no risk."

Kurtzig's *forte is encouraging entrepreneurship*

MARVIN COLLINS

Kurtzig thinks boards of directors are the antithesis of the risk-takers needed to lead companies. "I don't do boards or windows well," she said. "Very little is accomplished in the boardroom. Today's society is so litigious, boards react by [doing nothing]. If it's not broke, don't fix it."

Kurtzig encourages others to build their staffs by fostering a noncompetitive atmosphere and nurturing employees within it. As she spoke, her own style came across as warm and personal.

A former employee who dropped by her office was immediately asked if she was married yet. Another former employee got a big hug in the elevator. While male CEOs are unlikely to

Continued on page 99

Buy, buy

FROM PAGE 95

computer retail chains. "In the last three years, we've grown 1,200%," Miller said.

While Miller acknowledges that "getting to be an IBM is not something you do in 10 minutes," he said the NEC division aims to leverage the commitment and technical resources of its parent corporation's $22 billion a year in sales.

"We have a lot of clout working for us," Miller said. Included in that muscle are production of

Hitachi's Boudreau

semiconductors, communications products and computers, including supercomputers. NEC Corp. expects to debut a 20-GFLOPS model this spring that will be sold through its partnership with the recently renamed Bull H. N. Information Systems, Inc. in Billerica, Mass.

Then too, between $2.5 billion and $3.5 billion is being poured into operating system software development, a project that targets MS-DOS, OS/2 and Unix, according to Miller.

"Unix is the game of starting over," said NEC Business Systems marketing director Jeff Herrmann, who is drafting a mid-range strategy based on that multiuser platform. "We can get market share in an almost new market." He added that it is a market with an estimated 33% annual growth rate, from a value of $4.5 billion in 1987.

Herrmann and Miller each stressed that they are not under any illusions. "The company can't do it all at once," Miller said. "You have to walk before you run."

Gerry Boudreau, marketing and business planning director of Hitachi's Computer Division in San Bruno, Calif., also used those words to describe his company's efforts in the U.S. The division markets software, workstations, mainframes and peripherals.

Hitachi's Americanization

Considered by industry watchers to be the most conservative of the Japanese conglomerates in the computer business, Hitachi is learning to do business counter to its traditions. Boudreau calls the process "Americanization."

Japanese companies, he said, view sales and marketing as a single function. "The American only wants to sell or only to market, not to do both," Boudreau said. So at Hitachi, Boudreau has separated sales and marketing and pushed his staff to work more closely with customers. In six to nine months, Hitachi will appoint product managers, he said; later, it will bring in design engineers.

Only after Japanese companies changed their approach to the U.S. market, creating individual marketing positions, did they experience an uptick in computer-related revenues, said Boudreau, who started at Hitachi in November after five years at Fujitsu America.

"We're three to four years behind in Americanizing our process," Boudreau said. "Toshiba is two to three years behind. Fujitsu and NEC are all the way Americanized." Hitachi, he said, is "a $50 billion corporation with no marketing people."

Of Hitachi Japan's corporate revenue, Boudreau said, 9% is spent on research and development. Of that, 33% goes toward designing products for the information technology segment of the company. "It's the fastest growing and most profitable of Hitachi's divisions," he said.

The company's U.S. sales are mostly to OEMs, with about 80% to Fortune 500 U.S. computer companies that sell to Fortune 1,000 accounts, Boudreau said. He said he intends to diversify that sales focus to include distributors that sell to smaller accounts. "It's so our eggs aren't all in one basket," he said.

A second 1989 market push by Hitachi is expected with a PC called Hitfile, a Unix-based AT-compatible machine that Boudreau described as an image workstation for document retrieval that will be aimed initially at the medical and computer-aided design and manufacturing markets.

Also in the pipeline is a color laptop that made its debut earlier this year in Japan and that Boudreau hopes to bring to the U.S. by the end of this year.

All of this activity is separate from Hitachi's recently announced deal to join Electronic Data Systems Corp. in buying National Advanced Systems, which sells Hitachi mainframes in the U.S., from National Semiconductor Corp.

Fresh from settlement of the copyright infringement suit brought against it by IBM, Fujitsu plans to augment efforts begun last fall to modify U.S.-written software to run on its computers.

According to Mike Gluck, senior sales and marketing vice-president of Fujitsu America's Computer Products Division in San Jose, Calif., the mainframe software push will be an aggressive campaign. "It's just being formed and will be formally announced in the next few months," Gluck said.

Last fall, the corporate parent established Fujitsu Systems Engineering of America, Inc. in Santa Clara, Calif., to modify

NEC's Miller

U.S. software for use on Fujitsu computers in Japan, according to Yoshi Ichinose, president of the new division. The subsidiary has six programmers on staff, including two U.S. systems engineers.

At the lower end of the computing spectrum, Fujitsu is fine-tuning its value-added reseller (VAR) strategy and cranking up U.S. production of its modems, car telephones and disk drives for export.

"The OEM peripherals business is changing because of PCs and the growth of networks," Gluck said.

That, in turn, is forcing a change in Fujitsu's distribution plans. To date, Fujitsu has established 10 high-tech distributors as a result of a program pioneered five years ago. It is aimed at VARs with a high level of technical competence that are targeted to sell more advanced products.

"It's been a good marriage of American creativity and marketing ideas and Japanese manufacturing and engineering," Gluck said.

American aims

U.S. operations of Japanese computer makers detail individual strategies for 1989

Fujitsu Ltd.	Fujitsu Systems Engineering of America is modifying American software for export to Japan, while peripherals units target sophisticated distributors for advanced products
NEC Corp.	NEC Information Systems aims to continue boosting PC sales and develop multiuser Unix systems, while the parent company introduces a 20 billion floating-point operations per second supercomputer
Hitachi Ltd.	Hitachi's computer division plans to release an IBM PC AT-compatible imaging workstation, "Americanize" marketing with product managers and designers and add smaller customers

CW CHART: FRANK C. O'CONNELL

AT&T shifts gears with new unit

Reorganizing into small, autonomous groups yields AT&T Paradyne

BY ELISABETH HORWITT
CW STAFF

LARGO, Fla. — Seeking the product development and marketing agility to compete more effectively with small, aggressive competitors, AT&T is reorganizing into autonomous business units that will target specific product niches, according to a company spokesman.

The first such unit to be formally announced under this new plan is AT&T Paradyne, a subsidiary that will have profit and loss responsibility for data communications equipment from both AT&T and recently acquired Paradyne Corp.

The subsidiary will be headed by former Paradyne President John Mitcham.

AT&T's reorganization — which effectively reverses the move toward centralization that the company made in its last restructuring in January 1986 — is a "strategic business concept that incorporates the decision-making process into smaller organizations — not up top," said Joseph M. Cortese, division manager of product marketing at AT&T Paradyne.

This will enable AT&T to make quicker decisions in terms of modifying product strategies and delivering enhancements to meet fluctuating market demand, he added.

Will combine data lines

The new business unit will combine the research and development, sales and support organizations and data communications product lines of AT&T and Paradyne, which officially became part of AT&T last month. However, AT&T is still determining exactly what products will come under the "data communications equipment" heading, Cortese said.

For example, the vendor has yet to determine whether X.25 packet-switching equipment, which AT&T resells under an agreement with Telematics International, Inc., will come under the jurisdiction of AT&T Paradyne or that of AT&T's Business Communications Services unit.

Telematics' equipment is particularly difficult to categorize, Cortese indicated, because it is used both for private networking and as the basis for AT&T services such as the recently announced Private Packet Network Service.

Industry sources have questioned AT&T's motive for acquiring Paradyne, which suffered a net loss of more than $40 million in fiscal 1988 and which provides no new types of products to its new owner, with the exception of the Pixnet channel extender line.

Some overlap

While conceding that there is "some overlap" between the two vendors' products, Cortese said that Paradyne products bring additional capabilities to the table such as high-speed multipoint link support in the Paradyne 3400 modem line.

"Paradyne brought us a strong set of additional resources such as increased R&D, extensive international marketing capabilities and additional manufacturing facilities. Their expertise complements ours," Cortese said.

The new unit's main mandate is to sell and support data communications equipment worldwide, with a particular focus on the burgeoning overseas market, which is scheduled to grow at twice the rate of the U.S. market, Mitcham said.

One of the organization's first orders of business will be to integrate Paradyne communications equipment with AT&T's Unified Network Management Architecture, according to Mitcham.

The new subsidiary will continue to support and service Paradyne offerings as long as customers demand it, Mitcham emphasized. However, he did say that some products, such as modems, would converge. AT&T's data communications sales and support staff of approximately 1,100 will be trained to support Paradyne equipment, and Paradyne people will be trained to support AT&T equipment, Mitcham said.

Mitcham would give no numbers on the size of Paradyne's sales or R&D organizations prior to the merger.

NICKELS & DIMES

Infotron Systems Corp. announced revenue for the year ended Dec. 31 of $94.7 million, compared with $83.3 million last year. Net income was $4 million, or 78 cents per share, compared with a loss of $10.9 million, or $2.15 per share, in the previous year.

Revenue for the fourth quarter was $25.1 million, compared with $24.3 million in the fourth quarter of last year. Net income was $1.2 million, or 22 cents per share, compared with a net loss of $8.7 million, or $1.70 per share, in the like period a year ago.

Rabbit Software Corp. announced revenue for 1988 of $10.3 million, compared with $5.6 million in the previous year. Net loss was $5 million, or 36 cents per share, compared with a loss of $4 million, or 31 cents per share, a year ago.

Memorex Telex N.V. reported revenue for the third quarter ended Dec. 31 of $604.6 million, compared with $370.1 million for the like period a year ago. Profits were $23.4 million, or 62 cents per share, compared with $11.6 million, or 37 cents per share, one year ago.

Telco Systems Corp. announced revenue for the second quarter ended Feb. 26 of $18.6 million, compared with $14.8 million in the previous year. Profits were $407,000, or 5 cents per share, compared with $103,000, or 1 cent per share, a year ago.

Aldus Corp. reported revenue of $79 million and net income of $14.6 million for its fiscal year ending Dec. 31, compared with revenue of $39.5 million and net income of $7.8 million in 1987. Earnings per share was $1.15, compared with 66 cents in the previous year.

Revenue for the fourth quarter was $23.6 million, a 92% increase over the $12.3 million reported in the fourth quarter last year. Profits were $4.3 million, or 34 cents per share, compared with $2.2 million, or 18 cents per share, in the same period a year ago.

Dell Computer Corp. announced revenue for the year ended Jan. 27 of $257.8 million, compared with $159 million for like period last year. Profits were $14.4 million, or 80 cents per share, compared with $9.4 million, or 72 cents per share, a year ago.

Revenue for the fourth quarter was $80.1 million, compared with $48.9 million last year.

Profits were $3.3 million, or 17 cents per share, compared with $3.2 million, or 21 cents per share, in the like period a year ago.

Network Systems Corp. announced unaudited results for the year ended Dec. 31. Net income for the 12-month period was $11.4 million, or 39 cents per share, on revenue of $131.5 million, compared with last year's net income of $17.5 million, or 60 cents per share, on revenue of $120.5 million.

For the fourth quarter, revenue was $36.2 million, up slightly from revenue of $35.9 million for the comparable 1987 period.

Net income for the quarter was $1.4 million. In the fourth quarter last year, the company's net income was $5.6 million.

Comnet Corp. reported revenue for the third quarter ended Dec. 31 of $10.8 million, compared with $9.8 million a year ago. Profits were $51,000, or 2 cents per share, compared with $288,000, or 11 cents per share, in the like period a year ago.

EXECUTIVE CORNER

Geac Computer Corp., parent company of Vista Financial Systems, Inc. in St. Louis, has announced the appointment of **Stefan R. Bothe** as president and chief executive officer.

Most recently, Bothe was president of the Application Products Division at New York-based Computer Associates International, Inc.

Edward Kaniger, senior vice-president of Avnet, Inc., was appointed president of Hamilton/Avnet. The company is Avnet's largest unit and includes Hamilton/Avnet Computer, its computer products sector.

Execucom Systems Corp. has appointed **Bill Arkell** managing director of the newly organized development in the UK.

Execucom, headquartered in Austin, Texas, develops and markets business productivity software.

Corvus Systems, Inc. announced the appointment of **Timothy R. Larkin** as president, CEO and member of the board of directors.

Larkin, previously employed by Accolade, Inc., a publisher of entertainment software, replaces **Joseph W. Rooney**, who has been president and CEO since June 1988.

John E. Gates has been appointed president and CEO of Affiliated Computer Systems. Prior to joining Affiliated, Gates had served as national practice director of electronic-funds transfer/point-of-sale managements at Peat Marwick Main & Co.

"Of course we have a service plan, Chief! I only have to call 22 different companies."

LEASAMETRIC

Data Communications

Now you can get a complete service plan for all your PCs, peripherals, and network products. All from one company. Leasametric. No matter where your equipment came from. To find out more, call the nearest Leasametric office.

Northwest: (800) 343-7368, (415) 574-5797 • Southwest: (800) 638-7854, (818) 708-2669 • Central: (800) 323-4823, (312) 595-2700
Northeast: (800) 221-0246, (201) 825-9000 • Southeast: (800) 241-5841, (404) 925-7980

© Leasametric, Inc. 1988

Japan vendors to pay on dumped chips

BY NELL MARGOLIS
CW STAFF

WASHINGTON, D.C. — Leading Japanese manufacturers will soon be paying antidumping duties in the wake of the U.S. International Trade Commission's (ITC) decision last week in favor of a domestic vendor's petition to halt dumping of 3½-in. disks on the U.S. market.

According to ITC industry analyst Thomas Sherman, importers affected by the decision will pay extra duties to U.S. Customs in the amount by which Customs calculates their prices fall below fair market value. As determined in an earlier stage of the investigation, such amounts, called "weighted-average margin percentages," add up to 51% for Sony Corp., 27.7% for Hitachi Maxell Ltd., 50.5% for Fuji Photo Film Co. and 43% for all others.

Last March, Charlotte, N.C.-based Verbatim Corp., a wholly owned subsidiary of Eastman Kodak Co., filed a petition on behalf of itself and other U.S. disk suppliers contending that microdisks and related media made in Japan were being sold in the U.S. below fair market value.

Last month, following a lengthy investigation and a hearing, the ITC decided that Verbatim was right.

Last week, in a 4-to-1 decision, the ITC determined that Japan's dumping was causing or threatening to cause material injury to a U.S. industry.

The damage done

Verbatim Chief Executive Officer Richard Bourns said he was gratified by the ITC finding but not surprised.

Japanese disk dumping, he said, left "a trail of damage." He cited one company that filed for Chapter 11 bankruptcy protection and another example in which a company was forced to sell itself. Verbatim, Bourns said, "went through severe layoffs and had to shift some manufacturing of our lines offshore because obviously we wanted to continue to compete." In addition to revising its manufacturing strategy, Bourns said, Verbatim "was prevented from supporting the American economy."

According to the ITC tally, 11 companies in six states — California, Massachusetts, Arizona, Oklahoma, Nebraska and South Dakota — make up the domestic microfloppy disk industry.

"I think [the ruling] will be well received by customers," Bourns said. "It will bring about stabilization in the company and allow us to increase our investment in research and development."

YOUR COMPETITIVE ADVANTAGE: COMPUTERWORLD PERSPECTIVES 1989

The Annual Executive Conference for Strategic Information Management

June 20-21, 1989
Marriott Marquis — New York City

In today's competitive marketplace, the stakes are high. The future of entire corporations relies on the ability to effectively manage information systems — now and into the 21st Century.

Computerworld PERSPECTIVES 1989 is planned exclusively for senior corporate users and addresses in your most important business challenge: the information system as a competitive business tool.

Keynote Speakers

Shoshana Zuboff from the Harvard Business School, will talk about how changes in the information-based corporation affect corporate power and influence.

Michael Hammer of the Hammer Group, will address how systems management can best be applied in your corporation.

Donald Burr formerly of PEOPLExpress Airlines, will take a frank look at what goes right and wrong when applying technology.

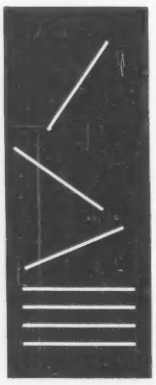
To gain the knowledge you need to competitively position your company for tomorrow, reserve your seat now at this important meeting.

Conference Themes

Pursue one of three themes or mix and match sessions based on your needs and objectives.

- **Winning Strategies:** Information Systems and the New Corporation
- **Mandates for Change:** Information Systems in the 1990s
- **Buying Smart:** Pacing your Information Systems Portfolio

Breakout sessions for each theme will give you an opportunity to explore critical aspects of each issue.



Yes!

I want to learn more about Computerworld PERSPECTIVES 1989 before May 1. I've attached my business card.

Mail to:
Leslie Price
Computerworld PERSPECTIVES 1989
c/o Cudaback Strategic Communications
5 Speen Street
Framingham, MA 01701
or telephone Leslie at (508) 875-5000.

Margolis

CONTINUED FROM PAGE 95

isn't going to be ready by the early target date that the company spat out to quiet the clamor.

Well, you say, they didn't have to jump the gun with the announcement.

Sure they did.

Nobody was going to let them get away with saying, "Hey, we've got something fine out there right now; we're working on something new and nifty, and you'll get it when we have it." Companies have tried that; they've been pilloried in the press and damaged on the Street. Honesty might be the best policy, but it makes the worst public relations, particularly in the superfast-track late-1980s technology market.

Companies recover from Vicious Circle Syndrome but not without loss of momentum, morale and investor support — all of which adds up to a drain on research and development, which hurts the users a lot more than it touches the press or the investors.

Microsoft will bounce back, probably quickly. Last week, however, a fair number of Microsoft eyes must have been staring longingly at BST.

BST is a 5-year-old venture-backed maker of change management software, a relatively new technology that helps software developers build products that can be easily altered, supported and maintained. Nice work if you can get it; BST says you can. But how many customers are going to listen to a startup vendor in a pioneer niche?

So BST brought in reinforcements. Last week, it announced agreements with five software vendors that are using, will endorse and, in several cases, will embed into their own well-known wares BST's flagship offering, Endevor.

BST was tempted to release its news as soon as the first of its powerful allies signed on, a BST exec said. However, "If we had, the whole thing might have backfired," he said. Fearing that the overarching strategy would be missed if serial announcements created the impression of an unbalanced sizzle-to-steak ratio, BST opted to wait until it could hit the public with five visible boosters whose aggregate installed bases span a vast chunk of BST's target.

Lots of companies could benefit from thinking like that. The irony is, lots of companies have outgrown the luxury.

Margolis is *Computerworld's* senior editor, industry.

IN BRIEF

See you in court

The Information Consulting Group, Inc. (ICG), formed last fall by six former members of **Arthur Andersen & Co.'s** consulting division, hit the Big Eight giant with a $300 million lawsuit last week. "For four months," ICG Chief Executive Officer Gresham Brebach Jr. said, "Andersen has waged a campaign of false statements, coercion and unfair trade practices against ICG. It will not succeed."

More Big Eight doings

New York-based **Coopers & Lybrand** and Boston-based industrial systems integration company **ITP Boston, Inc.** are taking joint aim at the U.S. industrial automation market.

It's MAI's turn again

Hot on the heels of his company's declaration of a proxy battle to unseat the board of directors of acquisition target **Prime Computer, Inc.** and substitute its own slate, **MAI Basic Four, Inc.'s** Bennett LeBow fired off a letter to Prime shareholders with a pledge: If MAI wins the proxy fight and a bona fide white knight tops MAI's $20-per-share offer for Prime within 30 days, MAI will either beat the offer or bow out, LeBow said.

Japanese appoint an American

Matsushita Electric Corp. of America, a subsidiary of the Japanese electronics behemoth Matsushita Electric Industrial Co. and parent of such household names as Panasonic, Technics and Quasar, last week announced that Richard Kraft will become the company's first American president and chief operating officer. Kraft, which joined Matsushita when the company acquired Motorola, Inc.'s consumer products division, succeeds Akiya (Andy) Imura, who will continue as CEO and chairman.

New super chief

Supercomputer maker **Elxsi Corp.** has a new chairman. Elxsi cofounder Joseph Rizzi replaces computer industry pioneer Gene Amdahl, whose resignation from the Elxsi board has been in the works for some time.

Sudden changes

San Jose, Calif.-based disk drive vendor **Priam Corp.** announced the resignation of President David Dury last week, effective immediately. Priam Chairman and CEO Glenn Maddalon is filling the breach.

Ask CEO

CONTINUED FROM PAGE 95

be offering hugs and matrimonial advice, Kurtzig noted, they can still foster a cooperative atmosphere.

"The CEO is the most important ingredient in the chemistry of a company," she said.

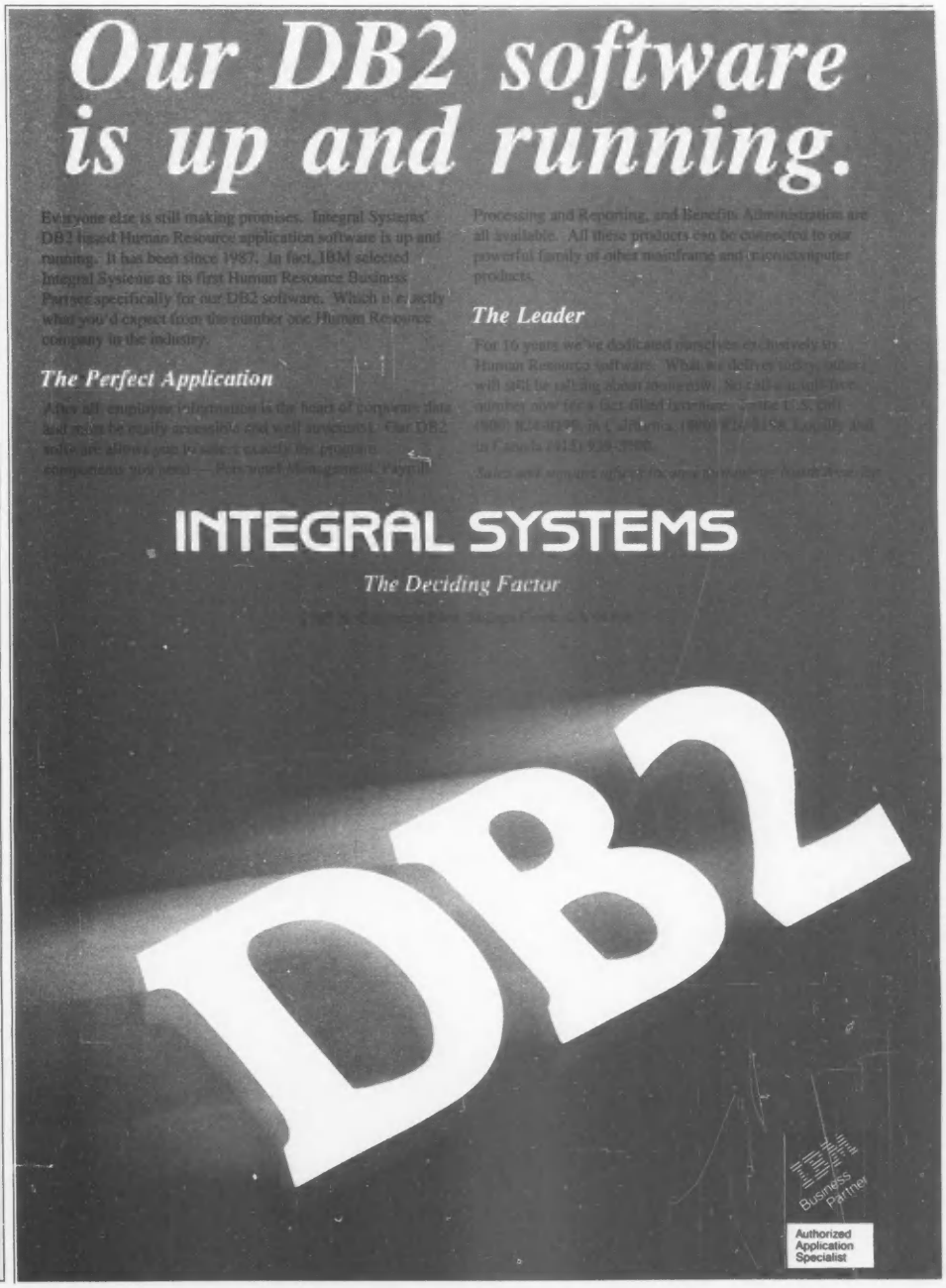
Ronald Braniff, Ask's current CEO, perpetuates Kurtzig's noncompetitive style, according to vice-president of research and development Martin Brown. But the extremely personal style of Kurtzig's management is not, and cannot be, perpetuated because the company has outgrown it, Brown said.

Although Ask has been run by a woman for 17 years, women's issues have taken a backseat to stockholder issues. While admitting she has been a role model for female entrepreneurs, Kurtzig has spent most of her working life downplaying any feminism. She didn't quit to have a family — her two boys are nearly grown.

WHILE ADMITTING she has been a role model for female entrepreneurs, Kurtzig has spent most of her working life downplaying any feminism.

Furthermore, Kurtzig estimated that 50% of Ask's staff is female, yet there are no women in top management. There is no day-care center at the company's customized seven-story office building because, she said, "Child care centers entail a lot of liability, and you have to separate being a businessperson from being a woman. At this point, it's not in the best interest of the shareholders."

Kurtzig said she does not expect to stay away from running a business for long: "I'm open to opportunity. I might not start another company, but I might take over a company. It's much easier to make the second million than the first."


Our DB2 software is up and running.
Everyone else is still making promises. Integral Systems' DB2 based Human Resource application software is up and running. It has been since 1987. In fact, IBM selected Integral Systems as its first Human Resource Business Partner specifically for our DB2 software. Which is exactly what you'd expect from the number one Human Resource company in the industry.
The Perfect Application
Processing and Reporting, and Benefits Administration are all available. All these products can be connected to our powerful family of other mainframe and minicomputer products.
The Leader
INTEGRAL SYSTEMS
The Deciding Factor
DB2
IBM Business Partner
Authorized Application Specialist

"...We know Computerworld reaches more decision makers in more of our target markets. And we know it's working."

— Bob Healy
Vice President/Marketing
Relational Technology

Relational Technology, based in Alameda, California, was one of the first companies to be devoted solely to the relational database market. And with its INGRES family of products--the most advanced distributed data management and application development system portable to all major computers--installed in over 8,000 systems worldwide, Marketing Vice President Bob Healy likes what he sees.

He also likes the fact that last year the company enjoyed a 90 percent jump in sales over 1986. Bob says this success comes from positioning a quality product in the right place at the right time in a dynamic marketplace. And the right place for advertising, he explains, is *Computerworld.*

"We advertise to build brand recognition — and to position our products clearly in a buying marketplace. With the types of products we market, we're not going for immediate responses to every ad. We just want potential customers to think of us when they need relational database tools.

"To accomplish this, we've made Computerworld *our flagship advertising vehicle. We chose it because we know* Computerworld *reaches more decision makers in more of our target markets. From MIS/DP management to general management — and at all levels — it's read by the people who are doing the buying.*

"And we know it's working. Studies have proven that our Computerworld *advertising is creating higher reader recall — and that's exactly what we want. So for the future,* Computerworld *will continue to be our principal vehicle for getting our advertising message across."*

Computerworld. Every week we help more suppliers reach more buyers in the computer market. We're working for Relational Technology, and we can work for you. For all the facts, call your *Computerworld* sales representative today.

COMPUTERWORLD

Desktop MIPS war

Computer firms braced against takeover winds

OS/2 loses heads at code farm

Because anyone can get a 3090

The Newspaper of Record for Information Systems Management

Boston(508) 879-0700/New York(201) 967-1350/
Washington D.C.(703) 280-2027/
Atlanta(404)394-0758/Chicago(312) 827-4433/
Dallas(214) 233-0882/Los Angeles(714) 261-1230/
San Francisco(415) 421-7330

An IDG Communications Publication

YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39* per year — a savings of 62% off the single copy price. In addition, I'll receive special bonus sections of COMPUTERWORLD Focus on Integration.

First Name MI Last Name

Title Company

Address

City State Zip

Address Shown: ☐ Home ☐ Business Basic Rate: $48 per year

* U.S. Only. Canada $110, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government — State/Federal/Local
65. Communications Systems/Public Utilities/ Transportation
70. Mining/Construction/Petroleum/Refining/Agric
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
90. Computer/Peripheral Dealer/Distributor/Retailer
75. User: Other _____
95. Vendor: Other _____
(Please specify)

2. **TITLE/FUNCTION** (Circle one)
IS/MIS/DP MANAGEMENT
19. Vice President, Asst. VP
21. Dir., Mgr., Supv., IS/MIS/DP Services
22. Dir., Mgr., Supv., of Operations, Planning, Adm. Services
23. Dir., Mgr., Supv., Analyst of Systems
31. Dir., Mgr., Supv., of Programming
32. Programmer, Methods Analyst
35. Dir., Mgr., Supv., OA/WP
38. Data Comm. Network/Systems Mgt.

OTHER COMPANY MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President/Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales/Mktg. Mgt.

OTHER PROFESSIONALS
60. Consulting Mgt.
70. Medical, Legal, Accounting Mgt.
80. Educators, Journalists, Librarians, Students
90. Others _____
(Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant
A. Mainframes/Supermins
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Office Automation Systems
F. No Computer Involvement

E4912-6

YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39* per year — a savings of 62% off the single copy price. In addition, I'll receive special bonus sections of COMPUTERWORLD Focus on Integration.

First Name MI Last Name

Title Company

Address

City State Zip

Address Shown: ☐ Home ☐ Business Basic Rate: $48 per year

* U.S. Only. Canada $110, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government — State/Federal/Local
65. Communications Systems/Public Utilities/ Transportation
70. Mining/Construction/Petroleum/Refining/Agric
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
90. Computer/Peripheral Dealer/Distributor/Retailer
75. User: Other _____
95. Vendor: Other _____
(Please specify)

2. **TITLE/FUNCTION** (Circle one)
IS/MIS/DP MANAGEMENT
19. Vice President, Asst. VP
21. Dir., Mgr., Supv., IS/MIS/DP Services
22. Dir., Mgr., Supv., of Operations, Planning, Adm. Services
23. Dir., Mgr., Supv., Analyst of Systems
31. Dir., Mgr., Supv., of Programming
32. Programmer, Methods Analyst
35. Dir., Mgr., Supv., OA/WP
38. Data Comm. Network/Systems Mgt.

OTHER COMPANY MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President/Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales/Mktg. Mgt.

OTHER PROFESSIONALS
60. Consulting Mgt.
70. Medical, Legal, Accounting Mgt.
80. Educators, Journalists, Librarians, Students
90. Others _____
(Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant
A. Mainframes/Supermins
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Office Automation Systems
F. No Computer Involvement

E4912-6

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

Test MBA programs for reality

In sizing up business schools, look for real-world contact and simulation

BY PATRICIA CARLSON
and JAMES C. WETHERBE
CW STAFF

In view of rapid improvement during the last few years, the technical education of MBA graduates concentrating in MIS is no longer an issue. What corporations are focusing on now is getting the best communicators and salesmen from among these graduates.

The companies that hire MIS MBAs want people who can bridge the gap between business problems in functional areas and technology that can help solve those problems.

Some organizations are starting to hire MBA graduates who have concentrated in fields such as marketing to help ensure that they get people with the ability to communicate and sell ideas effectively. Other organizations are using personality tests and batteries of interviews to eliminate MIS MBAs who reflect a technical rather than a human relations outlook on what management is all about.

Such developments mean that schools will need to develop the people skills of their MIS MBA students. At the same time, employers and prospective students should seek out progressive schools that take this direction.

How can future MIS MBAs and the companies that will hire them identify the schools where these people skills will be fostered? The answer comes in part from half a dozen MIS executives at the vice-president level in Fortune 100 companies. These executives were asked through in-depth telephone interviews to suggest ways in which college and university business schools could enhance the managerial savvy of their graduates.

Business experience helps

All the participants said that business experience prior to graduate school provides the ideal preparation for effective management.

Short of this experience, however, the executives described several other approaches that can help MBA programs develop business-oriented MIS graduates. Prospective MBA students and employers hiring MIS MBAs should check whether programs conform with these suggestions. They are:

- Teamwork. This practice is difficult to develop in the traditional classroom setting, where students are encouraged to compete individually. However, work demanded of MIS MBAs requires teamwork. Business schools must, therefore, take steps to accommodate this requirement with grading schemes that make the success of individuals dependent in part on team performance.
- Role playing. Schools can teach reality by putting students in real-life situations. There is nothing like being faced with an angry customer to make someone forget everything he has learned through conventional instruction. Such sessions can be videotaped and played back to provide an additional learning tool.
- Project work. Students can be assigned to go to companies and gather information or conduct studies. Contact with any organizations can help the students learn that each has its own priorities and processes, whether it is a not-for-profit outfit or a public institution such as the university itself.
- Not-from-scratch work. Usually, classroom projects are done from scratch — they are new for every student each semester. But most business problems have already involved others. To better reflect the problems that these other people may have introduced, students in accounting classes, for example, might keep financial records for a fictitious company and exchange books with their colleagues at mid-semester. There is nothing like taking over a "messy" project to get a taste of the real world.
- Computer games. Computer games in which each student is given a title and charge of certain functions of a company for a semester simulate the management world, exposing students to realistic situations. Harvard Business School is among the institutions that employ such tools.
- Top management topics. Classes or seminars should be conducted on leadership and policy. Leadership classes should examine what distinguishes leadership from management and demonstrate how to lead. Instruction on policy should bring together the lessons learned in other classes.
- Bring practitioners and students together regularly. Practitioners should be brought into the classroom to reinforce the sense of reality, and organizations should be encouraged to undertake other programs to bridge the gap between students and businesses.

> SCHOOLS CAN TEACH reality by putting students in real-life situations. There is nothing like being faced with an angry customer to make someone forget everything he has learned through conventional instruction.

Other efforts to explore

Other efforts might include internships, which are good for the organizations and the students. Many organizations use internships as a recruiting mechanism, routinely hiring 50% or more of their interns. The programs give students the opportunity to see if there is a fit within the organization and give the members of the organization a chance to look at the student.

Organizations should also be encouraged to join co-op programs, in which students work while continuing with school. They also should be encouraged to offer summer jobs to promising students.

Approaches such as the ones recommended by the top MIS executives will help balance the education of those people aspiring to manage in a field with one foot in the world of bits and bytes and the other firmly planted on the corporate ladder.

Carlson is a Ph.D. student at the University of Minnesota's School of Management and a research assistant at its MIS research center. Wetherbe is a professor of MIS at the university and director of the center.

INFORMATION CENTER SPECIALIST

We're PMI Food Equipment Group located near Dayton, Ohio. And we are widely recognized as the world's premier supplier of equipment, systems and services to the food industry. Our products marketed under the HOBART, FOSTER, STERO, TASSELLI and WOLF trademarks, are sold in more than 100 countries.

We are seeking a qualified individual to join our MIS staff as an Information Center (IC) Specialist. The IC Specialist will be responsible for the technical support of PMI Local Area Networks and provide assistance in troubleshooting PC hardware and software problems. He/she will also provide consulting and training to PMI Food Equipment Group employees in the use of end-user computing tools.

Candidates for this position should have proven experience installing and maintaining PC LAN hardware and software, preferable to include Token-Ring, IBM LAN Program and Novell Netware. Information Center and/or training experience is a plus. This position requires excellent oral and written communication skills.

We offer a competitive salary and benefits package. If you are interested and qualified, please send a resume with salary requirements to:

EMPLOYEE RELATIONS DEPARTMENT (EMR)

PMI Food Equipment Group

World Headquarters
Troy, OH 45374

An Equal Opportunity Employer M/F/H

Software Design Engineers

100 Years = Quality = Teamwork

ERICSSON, a pioneer in the telecommunications industry, opened its doors in Stockholm, Sweden over 100 years ago. Since then, we have expanded our operations all over the world. Our advanced, sophisticated, quality Business Communications Systems are the result of the contributions and commitments made by each member of our team. The R&D Group located in Orange County, California is currently involved in new projects and has openings for Software Design Engineers.

Our requirements include: degreed engineers (BS/MS in CS, EE or equivalent) with one plus years experience in any of the following: real time software design (ability to debug at assembly language level), and/or strong PC background in IBM, UNIX® MS/DOS, VAX/VMS (knowledge of "C" or Pascal). Telecommunications PABX voice/data experience desired for some positions; however, WE WILL TRAIN IN TELEPHONY for others.

Qualified candidates will enjoy a small team environment that encourages both personal and professional growth, an excellent compensation package, and the opportunity to be involved in the ongoing evolution of telecommunications. We invite you to call and submit a resume (please include salary requirements) to: ERICSSON BUSINESS COMMUNICATIONS, P.O. Box 4980-P, Anaheim, CA 92803. (714) 543-1663.

ERICSSON

An Equal Opportunity Employer

THE BEST OF BOTH WORLDS IS IN THE CAROLINAS.

First of all, we offer a great home base. A few hours in one direction and you're at a beach resort. In another direction, you're in the mountains, driving along one of our scenic highways. While our progressive area has rapidly become a center for data processing technology, it has retained much of its rural charm. Our comfortable climate, excellent universities, and moderate cost-of-living combine to make your leisure time the best of times in the Carolinas.

We also offer a great database, IBM's DB2, which is now our standard for the development of new applications and a symbol of our advanced systems. We're operating under MVS/ XA and VM/CMS utilizing an SNA/SDLC network and our programming languages are COBOL, SQL and DATACOM's IDEAL.

Our projects for this year have created immediate hiring needs for the following positions:

SYSTEMS ANALYSTS, DB ANALYST & DATA ANALYST

5+ years experience required in a systems development environment. Experience in structured analysis techniques; Conceptual Data Modeling; DB2; DATACOM/DB; On-line real-time systems; and formal systems development methodology is very important. Four-year degree preferred.

SENIOR TECHNICAL ANALYST

5+ years experience required in data communications in a large systems SNA environment. Excellent corporate communications skills (written, oral and presentation) together with project management and planning experience a must. Knowledge of PC's and Local Area Networks desirable. Four-year degree preferred.

LAN SUPPORT ANALYST

2+ years experience required in the design implementation and support of Local Area Networks, preferably in a LAN-to-LAN or a wide area connectivity environment. Excellent corporate communications skills (written, oral and client consulting) a must. Banyan network operating system experience and a four-year degree are very important.

If interested in an opportunity in the Carolinas, please forward a resume to: **Box CW-B5148, Computerworld, P.O. Box 9171, Framingham, MA 01701-9171.** An equal opportunity employer.

DEVELOPMENTAL SYSTEMS PROGRAMMERS, TECHNICAL SUPPORT ASSISTANTS, TECHNICAL SUPPORT REPRESENTATIVES

Due to rapid growth, Systems Center, Inc., formerly VM Software, Inc., a leader in the systems software industry, is expanding its technical staff. These positions will be at our corporate headquarters located in the surburban Washington, D.C. area.

Our developmental staff specify, design, code, test, maintain current products, and support marketing and sales opportunities. Solid developmental experience, with a minimum of 3 years experience programming in 370 Assembler, REXX, or C languages is required, along with excellent writing, communication, analytical, and organizational skills. VM systems programming experience is a plus!

Our technical support staff provide telephone consulting and problem solving to customers, product testing and documentation review, and pre-sales and post-sales support. Technical Support Assistants have a B.S. in Computer Science or related field and knowledge of IBM large scale operating systems. Technical Support Representatives also have a minimum of 2-3 years of VM experience. Both positions require excellent communication skills. Familiarity with System Center's VM products are a plus!

Systems Center, a New York Stock Exchange company, offers a unique work environment that promotes respect for customers, shareholders, and employees. Systems Center offers an exceptional benefits package and competitive salaries, with all employees receiving stock options. Qualified applicants should send resumes to:

SYSTEMS CENTER
FORMERLY VM SOFTWARE, INC.

1800 Alexander Bell Drive
Reston, VA 22091
Attn: Dept. PD-CS-39

JOIN THE PREMIER NATIONAL DB2 COMPANY

Immediate needs for Consultants specializing in:

*** Telon/CICS/DB2 P/A's**
*** DB2/COBOL/CICS P/A's**
*** DB2/CICS Sr. Applic. Designers**
*** DB2/CSP * IMS PL/1 * NOMAD2**

Consulting & FT employment opportunities available on State-of-the-Art projects. Full benefits.

KNAUERCONSULTING

500 Sansome Street
Suite 601
San Francisco, CA 94111
(415) 434-4200
FAX: (415) 434-0925

220 - Fifth Ave.
6th Floor
New York, NY 10001
(212) 684-0110
FAX: (212) 545-0433

LOOKING FOR ONLY THE BEST COMPUTER PROGRAMMERS AND ANALYSTS

● BAKERSFIELD ● ATLANTA
● SOUTHERN CALIFORNIA ● TEXAS

CONTRACT	PERMANENT
IMS DB/DC, ADS, 4th GL	Documerge
DB2, CSP, SQL/DS	Reinsurance
CICS, DL1, VSAM	VANTAGE SR. P/A
IBM PC, "C", LAN's, SNA	SR & INTERMED DBA, DB2
DATACOM/IDEAL	HP3000 COBOL
PACKAGE EXP. (MSA, M&D)	TANDEM COBOL
ADABAS/NATURAL	IDMS CICS
PL/1 & COBOL	MODEL 204
ADR IDEAL	SR SYS. ANAL. CICS. COBOL
IBM 8100 DDPX/SP2	CICS LIFE/70

IG Systems Inc.
3345 Wilshire Bl., Suite 501
Los Angeles, CA 90010
213/386-0400 213/386-0480

VIRGINIA
PROGRAMMER/ANALYST

New opening for RPG III Programmer/Analyst with 2-3 years experience on S/38 or AS400.

Excellent opportunity in the Shenandoah Valley of Virginia offering competitive salary plus an attractive benefits package.

Submit resume in confidence to:

Personnel Manager
CFW Telephone Company
P.O. Box 2008
Staunton, Virginia 24401

Equal Employment Opportunity M/F

TECHNICAL CONSULTANT. Design, develop and modify applications software running an UNIX* operating system in "C". Port complex applications, including Relational Databases and Document Processing Software between distributed processing systems. Analyze client requirements, design and normalize database schema, develop "C" interface modules and SQL scripts for on-line queries, formatting user-friendly terminal displays. Establish a communications interface for transfer of data between two computers. Prepare presentations and written proposals for prospective clients, analyzing problems, proposing solutions and detailed systems design. Some projects are performed on client sites at various geographic locations. Minimum Requirements: B.S. in Engineering or Computer Science. Must have 3 years' experience in the position offered. 40 hours per week. 9:00 a.m. to 5:00 p.m. $37,700 per year. Submit resume to: Illinois Department of Employment Security, 401 South State Street, 3 South, Chicago, IL 60605, Attention: Ms. Marie Ninneman, Reference #8945-N, AN EMPLOYER PAID AD.

*UNIX is a registered trademark of AT&T.

COMPUTER PROFESSIONALS

COMPUTER OPERATIONS & SOFTWARE PROFESSIONALS

There has never been a better time to consider a career with GE Aerospace Information Technology.

This is your opportunity to become associated with an organization offering a rare combination of immediate challenge and future commitment. Right now, GE Aerospace professionals are responsible for the design, development and implementation of today's most sophisticated information system and networking technologies. If this sounds like the kind of challenge you demand in your career, you should give every consideration to continuing your career with GE Aerospace.

MANAGER, SOFTWARE DATA COMMUNICATIONS– This position supports the operation, control and management of the Aerospace Data Communications Network. Your primary responsibilities will include the development and implementation of the multi-node network which links multiple departments/divisions while interfacing with local departmental LANs.

Our requirements include a BS or MS in a technical discipline and a minimum of 5 years experience in a data communications field, which should include at least 2 years in an applications environment. A thorough knowledge of network and operating systems technologies such as SNA, VTAM, NCP, Token Ring, DECnet, Ethernet, and X.25 is necessary.

PURCHASING & MANUFACTURING SYSTEMS DEVELOPMENT MANAGER– Position reports directly to Section Manager and is responsible for developing a common purchasing and manufacturing system for the Aerospace business. The implementation of this system will be a key factor in meeting the Aerospace business objectives for productivity enhancements compliance adherence, and leveraging of vendor purchases. We seek an individual capable of interfacing with the Program Manager and business representatives as well as building a high performance team to meet quality, schedule and cost commitments.

Our requirements include 5 years experience in the software development process as well as experience with manufacturing and/or purchasing systems. A BS in Computer Science or equivalent is also necessary.

SR. SOFTWARE ANALYSTS/SOFTWARE ANALYSTS Cullinet IDMS/DC Systems– Specific responsibilities include interfacing with users to analyze the functional requirements of the system; design, develop and test appropriate software applications; provide documentation and support systems implementation.

Requirements include a BS in MIS, Computer Science or a related discipline along with a minimum of 3 years applications software development experience.The Senior Software Analyst position also requires 1 year of experience managing other software professionals.

Applicants must be proficient in database and transaction processing applications for IBM environments. Experience with Cullinet IDMS/DC systems is required. A knowledge of ADSO, COBOL, JCL, 4TH generation languages, database systems and software development tools is also necessary. Exposure to financial analysis or proposal preparation would be significant assets.

DATA STORAGE PROJECT LEADER– This position is responsible for managing the ACS IBM/HBI magnetic media resources, ensuring the integrity of the data and providing the capability to recover lost or damaged data. Specific responsibilities include maintaining our on-site & off-site tape libraries, providing file restores on a timely basis, and optimizing data storage resources. This position is "on call" on a 24 hour/7 day/week basis.

Our requirements include a BS in a technical discipline and 5 years experience in an IBM mainframe computer operation which must include a thorough knowledge of magnetic storage media. Well-developed communication and organization skills and technical expertise in all aspects of data storage are necessary. Experience with HBI hardware would be a considerable asset.

DATA COMMUNICATIONS SPECIALISTS– Several opportunities exist for individuals to support the operation and control of GE Aerospace Data Communication Network. Responsibilities include the implementation of the multi-node network which link multiple department/divisions while interfacing with local department LANs. Requirements are a BS degree in a technical discipline and a minimum of 2 years experience in a data communications field. Knowledge of network and operating systems technologies is necessary.

SYSTEMS PROGRAMMER-IBM VM/SP-HPO Operating Systems– This is an exceptional opportunity to become a key member of GE Aerospace's Systems Programming Team. This group supports GE Aerospace financial applications, electronic mail and a host of specialized packages in a large, wide area network. Specific responsibilities include the installation and maintenance of IBM VM-SP/HPO and VM/XA-SP operating systems and related software products on an ACS IBM 3090/600E mainframe and an IBM 9370 RJE system.

Our requirements include 3 years experience in an IBM VM/SP-HPO operating environment including currrent experience in the installation and maintenance of VM software products such as XA, RSCS, SQL, ACF2, ASGCS, OMEGAMON and DisplayWrite 370. A BS in Computer Science or related discipline and well-developed communication skills are also necessary.

GE Aerospace offers an excellent salary, comprehensive benefits, relocation assistance along with continued opportunities for technical and management development. For immediate consideration please forward your resume to: **GE Special Search Operations, 234 Goddard Blvd., Room 126, King of Prussia, PA 19406.** U.S. citizenship is required.

GE Aerospace

Special Search Operations

An equal opportunity employer

COMPUTER CAREERS *MID-WEST*

DCS
Software and Consulting

SHARE OUR SUCCESS! AS/400

Major software and consulting firm located in Dallas, TX, offers dynamic positions for highly motivated individuals servicing the computing industry. Key positions are open in the following areas:

- **IBM/DCS Marketing Representatives**
- **Technical Computer Support Personnel**
- **Branch Managers for regional site locations**

DCS in one of the premier AS/400 organizations in its field, offering you a competitive salary, full benefits and relocation assistance. For consideration send your resume or letter of qualifications, including salary history, to:

Bill Duck
DCS, Inc.
12700 Park Central, Suite 308
Dallas, TX 75251
1-800-999-2495

An equal opportunity employer.

IBM Business Partner

PROGRAMMER ANALYST

As part of our commitment to continuing leadership in the transportation insurance industry, Baldwin & Lyons, Inc., is currently building a technical staff of professionals who will have key development responsibilities for software products that will lead us into the 1990's.

This is an excellent opportunity for personal and professional growth in our state-of-the-art environment using DMSII, COBOL, COMS and SDF. Our hardware consists of UNISYS A5, B5900 (Test Machine), B1900, B20's and related peripherals and auxiliary equipment.

Our ideal candidates will have three or more years of current experience developing application systems using mainframe COBOL and Database technologies. Experience developing property/casualty insurance applications is highly desirable.

For consideration respond in strict confidence by resume only, including salary history, to:

PERSONNEL DEPARTMENT
Baldwin & Lyons, Inc.
Protective Insurance Company
3100 North Meridian Street
Indianapolis, Indiana 46208
Equal Opportunity Employer

RESEARCH TRIANGLE OPPORTUNITIES

Currently recruiting experienced computer pros with background in any of the following: IBM Cobol mainframe applications; CICS; IDMS; IMS; ADS/O; ORACLE; DB 2; FOCUS; ADR DATACOM; SAS; VM/CMS; S/38 RPGIII or COBOL; DEC VAX COBOL or FORTRAN; HP3000; Series 1; Financial; Mfg.; MRPII; Banking; Insurance; MSA; Profs; Disposs; MVS; VM; NCP; VTAM or CICS Systems Progrs; DEC/VAX Systems Mgrs; Database Analysts; Data Modelling; POS/PC; Partial listing of local, regional & nat'l fee paid positions. Call or write:

The Underwood Group, Inc.
3324 Browning Pl. Suite 7
Raleigh, NC 27609
(919) 782-3024

IBM AS/400 Programmer

Oneida County, located amongst the forests and lakes of Northern Wisconsin, has an immediate opening for a IBM AS/400 Systems and Applications Programmer. Duties include: codes, tests, implements, and document programs for the IBM AS/400 in native mode. Must be able to convert programs written for IBM System 36 to native code. Technical training and experience with the AS/400 plus at least one of its programming languages is required. Three years experience in applications programming on an IBM midrange system also required. Oneida County offers an excellent wage and fringe benefit package as well as a high quality of living. If interested, send resume no later than April 3, 1989 to P. O. Box 400, Rhinelander, Wis. 54501, (715) 369-6154.

Equal Opportunity Employer
M/F/H/V

NCSA Research Programmer

Software lead for the NCSA Data Management Facility group. This requires supervision of a group of programmers, and responsibility for directing design, development, maintenance and functional well being of the NCSA data management facility. The project will be implemented under UNIX, and initially will involve no other operating system. First year primary functions are to lead the software team that creates the pre-prototype version of Data Management Facility (DMF) and, with help from this software team, to formulate detailed design for the prototype system.

QUALIFICATIONS:

Education:
B.S. or B.A. in computer science or engineering (Master's degree or equivalent experience preferred). Requires a high level of critical analysis and capacity for independent work in software systems design and computer science. Paramount requirements are knowledge of programming and computer system design characteristics.

Technical Experience:
Strong skills in C programming and in UNIX systems programming desired. Experience with construction of data management or mass store systems desired. Familiarity with basic network communication software, including TCP/IP a plus. Knowledge and experience with database systems a plus.

Administrative Experience:
Experience with the design and development of a large software system a plus. Strongly prefer some experience in directing a group of programmers (large or small.)

Must be able to work effectively in a cooperative environment and communicate effectively with several groups that are involved in the project.

This is a 12-month, 100%-time appointment with regular University benefits. Salary is commensurate with experience. Starting date is as soon as possible.

To ensure full consideration, please send letter of application, resume, college transcripts, and three letters of recommendation by **April 7, 1989** to:

Dr. Barbara Mihalas
National Center for Supercomputing Applications
152 Computing Applications Building - CW
605 East Springfield Avenue
Champaign, IL 61820
(217) 244-0637

The University of Illinois is an Affirmative Action/ Equal Opportunity Employer

DATA PROCESSING PROFESSIONALS

Become a member of the team who has made the **INC.500** for the third year in a row! Enjoy state-of-the-art environment and challenging assignments with one of the Southeast's fastest growing consulting firms. Our offices are located in NASHVILLE, TN; COLUMBIA, SC; CHARLOTTE, NC; and ATLANTA, GA.

Current openings for professionals with 2 or more years experience include:

DEC
* **DEC, VAX, ORACLE**
* **FORTRAN, RDB**
* **VMS, DECNET**
* **SYS MGR VAX**
* **COBOL, DBMS 32**
* **VAX, PDP, DCL, FORTRAN**
* **NATURAL/ADABAS**
* **Q or L CLEARANCE**
* **C, ORACLE, VAX**
* **TECH WRITER/ORACLE**

IBM
* **PC, C, DOS**
* **NATURAL/ADABAS**
* **CICS**
* **IDMS, ADB/O, CMS**
* **CICS, DL/1**
* **CICS, IDMS, ADS/O**
* **ASI MRP**
* **PC, C**

We offer excellent salaries and benefits. Call or send resume to our Corporate Office TODAY!

AMERICAN COMPUTER PROFESSIONALS
P.O. Box 5125
Columbia, SC 29250
(800) 332-0555
equal opportunity employer

FLORIDA and THE SOUTHEAST

Heat up your career. Make a move to the SUN BELT. Many opportunities exist in the following areas:

APPLICATIONS

CLAIMS PROCESS	To $55K
IDMS, ADSO	To $46K
IMS DB/DC	To $42K
BANKING	To $40K
HEALTH CARE	To $40K
RETAIL	To $40K
INSURANCE	To $40K
CICS, COBOL	To $40K
MSA	To $40K
PL/1, IMS	To $38K
MFG, DOS/CICS	To $35K
PICK	To $35K

MICHAEL JAMES & ASSOCIATES
2900 US Hwy 19N
Suite 309
Clearwater, FL 34621
(813) 796-6907

M.I.S. EXECUTIVE

National high-volume consumer products distribution company seeks aggressive individual to fill MIS executive position at Vice President level for Grand Rapids, MI location. Candidate should have significant experience in large-scale computing environment, preferably Digital equipment, and possess excellent communication and leadership skills. Candidate should be experienced in application design and development and capable of directing large application development projects. Highly attractive incentive and compensation package. Direct inquiries to:

Performance Evaluation Services, Inc.
MIS Management
P.O. Box 494
Knoxville, TN 37901

Operating System Specialist

We have an immediate opening in Technical Support for a key individual to modify/maintain existing software packages and develop specifications for complex software programming applications.

Qualifications include: 4 year degree in Computer Science or related area, knowledge of DEC/VMS, MVS internals, TSO, JCL, SMPE, Resolve, CMF, Librarian, MVS Utility programs, SPF and Assembler.

Successful candidates will have proven supervisory skills and work in an OS/MVS, IBM 3083, 4341 and System 88 environment.

Reply to:
CW-B5150
Computerworld, Box 9171
Framingham, MA 01701-9171
Equal Opportunity Employer M/F/H/V

$ NATIONWIDE $

prog/analysts, DBA's systems programmers communications prog'r software engineers

Ready for a career move? Relocate or stay in town? Our agents COAST to COAST; NORTH & SOUTH; will find the position you want:

OS/DOS	CICS	COBOL
PL/I	IMS	ADABASE
DB2	SQL	DATACOM
IDMS	CASE	ORACLE
S/3X	TANDEM	UNIX C
DEC	WANG	HP3000
PC	APPLE	MINI DB

ALL SW Packages & Industries. ANY and ALL other HW & SW. No fees, confidential search.

SYSTECH SEARCH
P.O. BOX 240003
MEMPHIS, TN 38124

DBA/DB2

Our Client, a Fortune 500 Company has 10 immediate positions available for DBA Designers, Modifiers & Technologists to assist migrating from DLI to DB2 and from a Hierarchical Data Base to a Relational Data Base. Our Client offers excellent Salary, Benefit & Relocation Packages.

If you have 1+ years experience in DBA design, monitoring, recovery, modeling, software check out and/or coverage, please send your resume in strict confidence to or call:

JYI Computer Professionals
PO Box 471140
Tulsa, OK 74147
(918) 492-7535

LAN $65,000

Dynamic Houston based corporation has urgent need, 3-10 years in management and previous experience with the installation of NOVELL. Company will relocate.

MANUFACTURING $42,000

International Texas firm seeks P/A ready to promote to DP Manager. One man shop. Manufacturing and/or IBM 38 required. Company will relocate.

SYS 38..... $45,000

Major Houston corporation seeks assistant P/A. Individual will promote to P/L after 15 months. 4-6 years solid 38, RPG III & a degree required. Company will relocate.

DDA $60,000

National corporation seeks Sr. Deposits Analyst. Client requires indepth knowledge of DDA & COBOL. Company will relocate.

SYS 38 P/A ... $40,000

Excellent opportunity exists on the Texas coast for an experienced P/A with RPG III. This well established retail chain offers full relocation, excellent benefits and very long term employment. Qualified people must have at least 4 yrs. experience on the SYS 38 and a heavy coding background.

SR SYS ANALYST..... $55,000

Very stable nationwide company seeks two individuals with a minimum 8 years of experience in systems analysis. Emphasis in the financial/acct. industry is required on one position: accounts payable/inventory control on the other. Both positions require 50% travel. Excellent benefits and full relocation.

ROBERT HALF
DATA PROCESSING
1360 Post Oak Blvd.
#1470
Houston, Texas 77056
(800)356-1994

VAX VMS NO RESUME REQUIRED 800-874-9595

NPS
NATIONAL PROGRAMMING SERVICES, INC.
121 EXECUTIVE CENTER DRIVE ☐ SUITE 240
COLUMBIA, SC 29210 ☐ TELEPHONE 803-772-9412

PROGRAMMING MANAGER COMPUTER CENTER

Live where others vacation in one of the fastest growing regions in the nation. Enjoy the Rio Grande Valley, gulf coast beaches and Old Mexico. Work in our progressive University environment as Manager of the Administrative programming staff. VAX 8700/8550 Cluster; DEC-System-10. Ethernet LAN. Information Associates Series Z University Information Systems implementation underway. Minimum of a Bachelor's degree required with at least four years progressively complex analysis, design and programming. Experience in **packaged software implementation,** conversions, tools, project management required. Preferred experience with Information Associates Series Z systems. Salary open. For further information contact: Pan American University, Personnel Office, 1201 W. University Dr., Edinburg, Texas 78539. Procedure to apply: A complete application must include the following: Application for employment, resume, transcripts, and three current letters of reference. Position open until filled.

Federal Law requires compliance with the Immigration Reform Control Act of 1986. PAU is an EEO/AA.

VTAM Systems Programmer

Growing state of the art shop in Omaha has an urgent need for a VTAM systems programmer. Experience with MVS ACF/VTAM, ACF/NCP, and Netview products is required, knowledge of VM ACF/VTAM, LAN communications, and any multi-sessioning products would be a plus. Salary to high 40's. Consider Omaha, rated the 37th best place to live in a survey of 329 metro areas in the U.S.

ROBERT HALF
DATA PROCESSING
7171 Mercy Rd #202
Omaha, NE 68106
(402) 397-8107

Senior Software Engineer wanted to analyze complex systems requirements; and, design, develop and implement insurance, financial and banking network software on UNISYS large system, IBM 3084 using DMS II, COMS, COBOL, ASSEMBLER, ALGOL, DCAL, GOL, WFL, VSAM, CICS and EASYTRIEVE; Requires Master's degree in Industrial Engineering, Electrical Engineering or Computer Engineering and one year experience; $45,000.00 per year; 40 hours per week. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref #14389 "Employer Paid Ad"

STATE-OF-THE-ART SHOPS 100 S DP OPPORTUNITIES

DICS--P/A's, MVS or DOS	$27-36K
DICS or DB2--Mfg. Appl. Cobol	$28-40K
IMS DB/DC--P/A's	$27-36K
IDMS-ADSO--P/A's	$26-36K
ADABAS/NATL--P/A's	$29-36K
Bank--IBM or Burr P/A's	$28-38K
Ins.--ALC, LIFE COM, LIFE 70	$30-42K
MSA--P/A's, G.L. or Payroll	$33-40K
PL1--P/A's	$29-39K
McCormick & Dodge P/A's	$38-42K
ORACLE	$30-36K
Dec Vax--RDB	$27-35K
FOCUS--VM/CMS	$28-35K
IDEAL, Datacom	$27-35K
Sys 38--P/A's RPG III or Cobol	$27-35K
Sys 36--S/A's, RPG III, JD Ed	$30-40K
MAPICS, RPG II, RPG III, P/A's	$27-36K
HP 3000, Cobol Cognos	$27-35K
HP 3000, Cobol ASK MANMAN	$27-36K
UNIVAC 1100 P/A's Mapper	$28-35K
DB 2--P/A's SQL	$28-40K
Sys. Prog. MVS/XA, NCP, VTAM	$36-48K
Data Base Anal's, IMS or IDMS	$40-48K

Major Co.'s seeking confident promotable, D.P. Professionals w/ 2+ yrs. work expr. Locations: So., S.E., Many Carolina's & Nationwide. Ask for our Free Resume Guide. Attn: T. Smith, D.P. Spec. (504) 285-1240

BADON'S DP Div.
6007 GALERIA, BATON ROUGE, LA 70816
"Interviews & Fee's Paid by Client Co.s"

WANG SUPPORT SPECIALIST

We have an immediate opening for a Systems Support Analyst in our Customer Support area. This position will include determining configurations, presale, sales support, customer installations, operator training and customer support. The position offers travel a few times per month.

Wilke/Thornton sells turnkey systems consisting of WANG hardware and our own software written in a 4th Generation Language. Our customers consist of Fortune 1000 companies throughout the United States.

You should have experience in installation and support of all Wang VS hardware and software products, i.e. WSN, Word Processing, SNA, OFFICE, File Transfer, VS procedure language and other communication products. You will have the opportunity to learn our 4th Generation Language and application in order to round out your support capability.

Submit resume to: Wilke/Thornton, Inc., 555 Metro Place North, Suite 650, Dublin, OH 43017.

COMPUTER SYSTEMS ANALYST/ CONSULTANT

Must be able to determine hardware and software requirements of clients; direct preparation of system studies, analysis and detailed proposals for the development of application systems in a database environment; verify technical specification. Design and implement systems, including supervision of EDP staff in installation, maintenance and software design. Monitor and evaluate technical capabilities and performance of EDP staff assigned to client account. Detect, diagnose and correct problem areas. Prepare user manuals and provide recommendations for upgrading and improvements in operating efficiency. Use of CICS, MVS, COBOL, and VSAM Programming Languages. Bachelor's degree in Electronic Engineering, Computer Science, Mathematics or related degree. (Elec. or Comp. Sci background.) Must have two years experience in job offered or two years' experience in Software Design Database Development with Languages as above. Forty hours per week; $62,000 per annum. Apply at the Texas Employment Commission, Dallas, Texas. Or send resumes to the: Texas Employment Commission, TEC Building, Austin, Texas 78778. Job Order # 5424838. Ad paid by an Equal Opportunity Employer.

PROGRAMMER/ANALYST. Design and develop a graphical user interface using windows, icons and pointing devices for sophisticated engineering simulation software to be used on P.C. desktops and engineering workstations. Develop "friendly" and "intelligent" software to manage Computer Aided Engineering software products used in Process Simulation and Optimization, Heat and Material Balance and Engineering Design. Modify existing software to meet hardware/software requirements of desktop computers. Use C and FORTRAN under DOS/UNIX environment. 40+ hrs/wk. Bachelor's degree in Engineering and Master's degree in Computer Science. 6 mos. exp. in job offered or 6 mos. related exp. in menu and windows based software development using "C" on P.C.'s. $769.23/wk. Apply at the Texas Employment Commission, Houston, Texas or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778. Job Order #5517507. Ad paid for by An Equal Opportunity Employer.

Computer Systems Engineer wanted to analyze complex systems requirements; and design, develop and implement business and scientific applications on XE550, "A" series using INGRES, LINC and "C" under a UNIX environment; Requires B.S. degree in Electronics & Communications Engineering or Computer Engineering and two years experience; $41,800.00 per year; 40 hours per week. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref #11789 "Employer Paid Ad"

MIS SYSTEMS ANALYST/ MANAGER

We are a progressive and innovative telecommunications company seeking an experienced manager to develop and implement computer/report generation systems to facilitate our expanding product lines. The successful candidate will possess a working knowledge of COBOL and PASCAL, excel in organizational skills, and be a self starter. A four year degree is preferred, or a two year degree with five years management experience. Please forward a resume and salary requirements to P.O. Box 839, Lima, Ohio 45802.

DP

S/36 - AS/400 Local & regional positions for S/36 profess. Top pay for those skilled in RPGIII and CL. All levels of experience needed. Inquiries are confidential. Client pay relocation and fees.

ROMAC
Professional Recruiters
6000 Poplar Avenue, Suite 340
Memphis, TN 38119
901-685-6500 FAX:901-684-1600
Darlene R. Murphy, Partner

TRY OUR 24 HOUR ON LINE DP JOB LISTINGS

CALL 919-222-0979

DP RESOURCES, INC.
P O Box 5057
Burlington, NC 27216-5057

COMPUTER CAREERS NETWORK

Now you can recruit the best qualified computer and communications professionals regionally, nationally and weekly.

How?
With IDG Communications new Computer Careers Network. Choose from the Network's five computer-related newspapers and tailor your recruitment message to the type of talented professionals you need to reach -- professionals that read Computerworld, InfoWorld, Network World, Digital News, and Federal Computer Week. Then, target your audience by region. Or blanket the entire nation.

Call your local sales representative today for more information about Computer Careers Network's regional, national and weekly reach.

Sales Offices: **BOSTON:** 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, (508) 879-0700; **NEW YORK:** Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652, (201) 967-1350; **WASHINGTON:** 8304 Professional Hill Drive, Fairfax, VA 22031, (703) 573-4115; **CHICAGO:** 10400 West Higgins Road, Suite 300, Rosemont, IL 60018, (312) 827-4433; **LOS ANGELES:** 18004 Sky Park Circle, Suite 100, Irvine, CA 92714, (714) 250-0164; **SAN FRANCISCO:** 18008 Sky Park Circle, Suite 145, Irvine, CA 92714, (714) 250-0164

PROGRAMMER ANALYSTS/APPLICATIONS ANALYSTS

HUMUHUMUNUKUNUKUAPUA'A

Aloha (ah-LO-ha), akamai (ah-kah-MYE) and humuhumunukunukuapua'a (who-moo-who-moo-nu-coo-nu-coo-ah-poo-ah-ah) are a few of the words you'll learn here in Hawaii.

Bank of Hawaii is expanding into new computing fields—Japanese language ATMs, a complete deposit system replacement, transoceanic data communications and a new state-of-the-art credit card system.

We're looking for data processing professionals with a minimum of three years experience in: Hogan Integrated Deposit Systems, ACI Base-24 & POS, Dyatron's Omnitrust and Focus Based Systems.

The technical environment is IBM 3084/3081, MVS-XA, CICS, VSAM, COBOL, OS-JCL, TSO/ISPF, PANVALET, ACF2 and TANDEM.

With our commitment to professional growth and continuing education, career opportunities here are virtually limitless. Our management team has a fresh, new approach and welcomes innovation.

Please send your resume, in confidence, to Bank of Hawaii, Human Resources Division, P.O. Box 2900, Honolulu, HI 96846.

You already know computer languages, now learn the language of life in Paradise.

Bank of Hawaii
HAWAII'S BANK

ALOHA: *WELCOME, LOVE;* **AKAMAI:** *SMART, LIKE YOU;* **HUMUHUMUNUKUNUKUAPUA'A:** *A TINY HAWAIIAN FISH THAT LOOKS LIKE A JIGSAW PUZZLE WITH A NOSE LIKE A PIG.*

MEMBER FDIC

EQUAL OPPORTUNITY EMPLOYER

THERE IS A DIFFERENCE

At Syntel the difference is a committment to **YOU!**

- **Career Opportunities**
- **Salaried/Consulting Positions**
- **Technical Training**
- **Strategic Career Development**

Many of our Fortune 500 clients need your talents in-

IDMS/ADSO **DB2/CICS/IMS DB/DC**
TANDEM **ALC, ACP/TPF**

Explore the difference Syntel can offer. Call or write -

SYNTEL

5700 Crooks Rd. • Troy, MI 48098 • 313-828-3290 FAX: 313-828-3307

ELECTRONICS-DESIGN ENGINEER (TELECOMMUNICATION CIRCUITS) - 40 hrs/wk (9-5pm), $33,000/yr: Design and develop specialty telemarketing equipment, specifically electronic circuits using software engineering skills. Develop software (CAD/CAM tools), analyze telecommunications devices (longitudinal data transmissions) such as high speed modems, data analyzers, telephones, microprocessors & electronic switches. Use of telephone switching systems, oscilloscopes, meters, EDP equipment, using Assembly, Fortran, Pascal, PCBPADS, Orcad & C Software. BS in Electrical Engrng; 2 yrs. exp. Send resumes to 7310 Woodward Ave., Room 415, Detroit, Michigan 48202. Ref. #12089. Emp. pd ad.

Computer Software Engineer wanted to analyze complex systems requirements; design, develop and implement banking, network and communication software on UNISYS Large Systems (A12, A9, A3) and CP2000 using ALGOL, DCALGOL, BNAV2, COMS, DMS II, and develop software on IBM S/36 and VAX 11/780 using VAX, VMS, RSTS-E, COBOL and Datatreive; Requires Bachelor's degree in Physics, Mathematics, Electrical Engineering or Computer Engineering and two years experience; $41,800.00 per year; 40 hours per week. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref #14589 "Employer Paid Ad"

A Terrific Opportunity

Computer Consulting Group, one of the **Southeast's** fastest growing contract programming and consulting firms, has immediate openings for talented Programmer/Analysts with 2 or more years experience. Excellent salary & benefits package. We're especially seeking:

SYS PROG DEC OR IBM
DEC/ADABAS P/A
VAX/TEL-A-GRAF
HP 64000/C ENGR
COBOL/IMS P/A
IDMS/ADSO/MANUF
VAX/FORTRAN
VAX/COBOL
NATURAL/ADABAS
WANG/COBOL P/A
Q-CLEARANCE
DEC/PDP/FORTRAN
HP/TRANSACT
TECH WRITERS
DEC/NETWORKING
VAX/RDB P/A

Computer Consulting Group
Contract Professional Services

Research Triangle Area
4109 Wake Forest Rd.
Suite 307
Raleigh, NC 27609
1-800-222-1273

Programmer Analysts

As one of the nation's most progressive natural gas companies, MichCon is meeting the needs of over one million customers throughout Michigan. We're also meeting the needs of the professionals who work for us. Our Detroit location puts you within easy reach of big city excitement with many professional sports teams, cultural and entertainment activities to enjoy. And we offer excellent career opportunities with good advancement potential. Right now, we have openings for Programmer Analysts at the intermediate and advanced levels.

You will be responsible for new development projects including designing, programming, testing, documenting, implementing and maintaining major computer applications. You will also participate in user interfacing and group coordination. To qualify, you need a Bachelor's degree or equivalent and at least 2 years' work experience in a Data Processing environment on a large IBM mainframe (3083 or above) using MVS or an equivalent operating system. VSAM file structure experience and CICS command level coding is desirable with at least 2 years' COBOL programming, preferably in major applications development.

We offer a good work environment and supportive management team. Compensation and benefits are excellent. For consideration, send your resume to: **Personnel Office, Michigan Consolidated Gas Company, 500 Griswold, Detroit, MI 48226.** Equal Opportunity Employer M/F.

michcon

DP OPPORTUNITIES

HARTFORD, CT 06103 **(203) 278-7170**
FAX # (203) 278-0320
One Commercial Plaza

DEC TECH SUPPORT
New Eng div of major corp seeks 2 key people: syst mgr to suppt VMS and other syst sft'wr, and a DBA to suppt DBMS. Exp w/install ASK MANMAN in multi-site environ is a major plus! Full reloc, affordable housing, excell loc & benefits. To $49,000

MGR SYS & PROG
Major CT hi-tech firm seeks person with 3+ yrs in mgmt capacity with solid tech, mfg and business bkgd. Effective team bkgd, commo and leadership abilities are key. Exp w/factory Data Collection sys and/or ORACLE are pluses. To $53,000

4GL
New Eng is gearing up for 4GL's. If you have 1+ yrs exp devel appl's using DB2, SQL, CSP, ORACLE or other fourth generation lang's, we have multiple oppty's to discuss with you. Contact us today for details. To $50,000

SYST MANAGER
Hi-tech VT firm has opening for indiv who can bring solid knowl of CASE tools, 4GL's and the latest syst devel technologies to their org. Effective verbal and prior supvry skills are essential. Full reloc, super loc! To $55,000

BUFFALO, NY 14202 **(716) 842-0801**
FAX #(716) 842-0470
420 Main Street
1112 Liberty Building

RPG III PROGRAMMER ANALYSTS
IBM's successful penetration of the upstate New York manufacturing market has created countless opportunities for System 38, RPG III programmer analysts. We offer a quality of life 2nd to none in growing, stable companies. Please call! To $38,000

CONTRACTING OPPORTUNITIES
4th GL. Well-known upstate New York and national companies are seeking contract employees with IDMS/R, DATACOM/IDEAL, ADABASE/Natural, DB2, ORACLE. Opportunities abound in the eastern USA. Call now! To $48,000

CHARLOTTE, NC 28244 **(704) 339-0550**
FAX #(704) 342-2700
1710 Charlotte Plaza

MANAGEMENT CONSULTING
Prestigious MC firm seeks systems consultants, w/3+ yrs exp. Solid academic record (MBA a big plus), professional image and strong ambition a must. Knowledge of fin'l and mfg sftwr (MSA, A5) or M&D highly desirable) a must. Top-notch oppty for committed syst's pro's. To $60,000

COBOL, CICS, DL-1
Coastal Carolina firm seeks exp prog/analyst w/3+ yrs exp in design, coding, implementation in an IBM mainframe environ. Excell oppty for professional growth. Great location for work and play! To $40,000

ROBERT HALF
DATA PROCESSING
PERSONNEL SPECIALISTS

Contact Manager in office listed above. Client Companies Assume All Fees.

RECRUIT THE BEST!

Place your ad in regional or national editions of Computerworld's Computer Careers section. For more information, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).

DP PROFESSIONALS
San Antonio, Texas

Work for the company that...

- Keys 5,200,000 full function IMS transactions daily (7 million projected by 1990)
- Is known for using technology as a strategic weapon
- Has a CEO who committed to going paperless in 1969
- Assisted in developing an "Image of the Future" for IBM*
- Has a 4 day work week
- Provides a flexible benefit package
- Works with tomorrow's technology...today

ISD is comprised of seven departments:

Planning and Administration; Property & Casualty Systems; Financial Services Systems; Financial & Corporate Systems; Claims Systems; Computer Center; Business Systems Communication.

PRODUCTS and SERVICES:

■ Property & Casualty Insurance ■ Investment Services ■ Discount Brokerage Services ■ Banking Services ■ Satellite Communications Company ■ Travel Services ■ Buying Services ■ Life and Health Insurance or Annuities

Immediate opportunities exist for the following professionals in our Information Services Division, which is one of the five major USAA Divisions and employs over 1,400 employees (total 8,000 at USAA Home Office):

■ Programmer Analysts
■ Systems Analysts
■ Telecommunication Analysts
■ Applications Programmers
■ IMS Data Base Specialists
■ Software Programmers
■ Systems Programmers

If you possess solid IBM mainframe experience, and have hands-on experience in 1 or more of the following software applications we would like to hear from you:

IMS	CICS	DB2
VTAM	VSAM	PLI
FOCUS	MVS/SP	TSO/E
	COBOL	

San Antonio, the 9th largest city, has many amenities to offer...a scenic Riverwalk, the symphony, live theater, fine dining, night life, professional sports, cultural events, as well as 5 major institutions of higher education.

Qualified candidates please send resume to:

USAA
9800 Fredricksburg Road
USAA Building
San Antonio, Texas 78288
Attn: TLL/CW/320

USAA

An Equal Opportunity Employer, M/F.
PRINCIPALS ONLY, PLEASE.

MVS System Developers...Join a

Leading Edge Research and Development Team!

Be a part of an exciting project that is building file system connectivity for the 1990's. The Institutional File System, funded jointly by The University of Michigan and IBM Corporation, is developing a centralized file server utilizing UM's three IBM 3090s and the campus fiber optic backbone network. The target users are projected to be 30,000 workstations (UNIX, MS-DOS, OS/2, Macintosh). The system is based on the Andrew File System, initially developed at Carnegie Mellon University. We are porting Andrew from its UNIX workstation base to IBM's MVS/ESA, AIX/370, and VM/CMS operating systems. We are adding extensions for security, scale, performance, and centralized administration.

We are now looking for additional MVS system developers to join our project. You must have at least 2 years experience in MVS systems development. You will port UNIX file server code to MVS using C and assembly languages, Inspect, TSO test, Session Manager, and ISPF/PDF. You will exploit MVS/ESA features such as large memory-mapped file spaces utilizing dataspaces and Data in Virtual.

You will receive a competitive salary, excellent benefits, and the opportunity to expand your skills and experience while working on a major distributed computing project. To find out more about this leading edge effort, please send your resume by April 10, 1989 to: The University of Michigan, ATTN: MS-IFS-SRP-CW, SCIL Personnel Service Center, 1020 LS&A, 500 S. State Street, Ann Arbor, MI 48109-1382, or call Marjorie McRoberts at (313) 764-6580.

The University of Michigan

A non-discriminatory, affirmative action employer

AIRLINE OPPORTUNITIES

USAir, a progressive and innovative airline is growing and we are seeking experienced data processing professionals to grow with us at our facilities located in Winston-Salem, NC, and Washington, D.C.

OPERATIONS RESEARCH ANALYSTS

The successful candidates will have either a Ph.D. in OR, Industrial Engineering, or Management Science with professional experience in either inventory or scheduling problems; or will possess a M.S. plus four years experience. A broad range of OR skills is required with an additional speciality in either stochastic processes or combinatorial problems desirable. Proficiency in at least one scientific programming language is necessary. Washington, D.C. location.

QUALITY ASSURANCE ANALYST

2-3 years technical training experience with degree in DP or Business required. Knowledge of productivity tools, TSO, ISPF, VM/CMS Editor, JCL, and strong analytical and communication skills needed for these positions. A working knowledge of life cycle methodologies, standards and procedures, and quality assurance techniques required for both NC and DC locales.

Join our team of professionals by forwarding your resume with salary history to: USAir, Employment Services Dept. CW389, P.O. Box 15864, Arlington, Virginia 22215. EOE/M/F. PRINCIPALS ONLY.

USAIR

SENIOR SYSTEMS ENGINEER - EDUCATIONAL CONSULTANT required. Educational Consultant to Technical Training Instructors in ACP/TPF Systems and Software. Responsible for technical content of training offered, preparation of Training Manuals, and course instruction in ACPDB (the ACP database manager system). Will also be teaching other courses where necessary to cover class overloads or as a substitute instructor. Will be available to answer technical systems or software inquiries of instructors and professional students, as well as of the engineering and programming staff of the company.

Applicants required to have a Bachelors Degree in Math, Computers, Engineering or its equivalent plus at least four years experience in Technical Training in ACP/TPF Environment. Experience must include at least two years of ACPDB (TPFDB) technical training. Education and experience will be acceptable if applicant possesses a combination of formal education, experience, and professional development found to be equivalent to a Bachelors Degree in Computers in addition to the four years of required experience.

Annual salary will be $50,000.00 per year for forty hour work week.

Interested applicants apply at the Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, Austin, TX 78778-0001, J.O. number 55 17504. This advertisement was paid by an Equal Opportunity Employment Employer.

The Romac Report. 1989 Edition Yours free.

The Romac Report contains information for professionals in data processing, accounting, finance, and banking. The Report is a compilation of information gathered through Romac's network of national offices on the economy, compensation, best (career) bets, professional temporary employment services and more. To receive your free copy, call the Romac office nearest you.

ROMAC

Albany, NY 518-463-6644	Dayton, OH 513-461-1373	Newburgh, NY 914-565-0700	St. Louis, MO 314-231-6334
Atlanta, GA 404-688-0033	Ft. Lauderdale, FL 305-928-0811	Orlando, FL 407-843-0765	San Diego, CA 619-231-9650
Bala Cynwyd, PA 215-667-7351	Hartford, CT 203-525-8037	Philadelphia, PA 215-568-6810	San Francisco, CA 415-788-2815
Boston, MA 617-439-4300	Houston, TX 713-227-7700	Portland, ME 207-773-4749	Seattle, WA 206-646-6640
Buffalo, NY 716-853-6203	Jacksonville, FL 904-358-6868	Portsmouth, NH 603-431-2706	Stamford, CT 203-358-8155
Charlotte, NC 704-333-3166	Manchester, NH 603-647-0200	Providence, RI 401-421-2250	Tampa, FL 813-229-5575
Chicago, IL 312-263-0002	Memphis, TN 901-685-8500	Raleigh, NC 919-878-4454	Washington, DC 202-775-9055
Cleveland, OH 216-771-6822	Miami, FL 305-354-8367	Richmond, VA 804-644-0196	Wayne, PA 215-687-6107
Costa Mesa, CA 714-432-6352	Minneapolis, MN 612-334-5990	Ridgewood, NJ 201-445-5456	Wellesley Hills, MA 617-239-0900
Dallas, TX 214-720-0050	Nashville, TN 615-259-1370	Rochester, NY 716-232-4610	Wilmington, DE 302-658-6181
			Winston-Salem, NC 919-725-1933

All Romac offices are independently owned and operated.

Sales Engineer- responsible for sales of computers and network systems to large accounts in the financial and entertainment industries; penetrate Management Information Systems (MIS) organization of specific Fortune 500 companies; call on MIS management representatives, such as engineers, and other executive, professional and technical personnel at commercial and industrial establishments; review overall computing strategy; provide integrated solutions with large MIS organizations; implement customer plans and needs to develop and prepare cost estimates, propose changes to result in cost reduction or improvement in operations; provide technical services to clients relating to use, operation, and maintenance of equipment; prepare sales and service contracts; develop and maintain long-range strategic account business plan; provide leadership and direction to sales and support personnel. Requirements include Bachelors degree in computer science or electrical engineering; or equivalent combination of education and experience; with at least eight years sales, marketing and applications experience in systems sales and account management including at least five years' experience with MIS senior management. Thorough knowledge of VMS, ULTRIX, MVS/XA, CICS, DOS/VSE, RPG, MS-DOS operating systems, CASE software development tools including VAXSET, DEMS and Rdb database systems, Decnet networks and All-in-one VTX applications; as well as IBM systems. Strong background in international business and systems. Willingness to travel. Salary $79,123/yr. 40 hrs/week. Respond with resume only to: Job Order #FL0059624, Job Service of Florida, 3421 Lawton Road, Orlando, FL 32803.

DP OPENINGS $20,000-$50,000

We are seeking PROFESSIONALS to fill positions as Programmers, Systems & Programmer/Analysts, System Programmers and Data Base Analysts in the following areas:

- IBM S/36, 38, AS/400, RPG II/III, MAPICS 4381, 3090, OS/MVS
- UNIX/C
- IDMS, ADSO, CICS, COBOL
- IMS DB/DC, DB2
- DEC VAX, VMS, JCL

Please call or send resume to Amanda McMahan

PROFESSIONAL PERSONNEL ASSOCIATES, INC.
5527 Monroe Road
Charlotte, NC 28212
(704) 532-0288
FAX: (704) 532-0310

SOFTWARE DEVELOPERS

As a nationwide placement firm specializing in UNIX system developers, programmers, and software engineers, Innovative Options can help you explore positions throughout the national high tech, R&D community.

Our nationwide clientele and network of affiliates can offer challenging opportunities (without cost to you) in any of the following areas:

- UNIX/C
- VAX
- Applications or Systems Development
- Networking/Telecommunications
- Database Development

Prefer BS, MS, or PhD in Computer Science or EE. No entry level positions available. Send your resume in confidence to:

INNOVATIVE OPTIONS
P.O. Box 21560 • Columbus, OH 43221 • (614) 457-8383
UNIX is a Trademark of Bell Labs

MIS DIRECTORS

If you need good people, we've got them. Computerworld reaches more than 612,000 computer pros every week. That's more qualified computer pros than any newspaper can deliver. And you can select either a regional edition or national edition of Computerworld's Computer Careers section for your ad.

For more information, or to place your ad regionally or nationally, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).

Weekly, Regional, National. And It Works...

Systems Programmers & Programmer/ Analysts
Carolinas & VA

MVS/XA Sys. Prog. (Gens/Planning) . . . $45K
IDMS or IMS Prog./Analyst (Mfg Apps) . $25K
CICS Sys. Prog. (Maint./Debug) $60K
MSA Prog./Analyst (Fin. Apps./COBOL) $38K
NCP/VTAM Sys. Prog. (Gen/Tuning) . . . $45K
CICS or DB2 P/A (Mfg. Apps./COBOL) . . $40K
IMS or DB2 Sys. Prog. (Gens/Tuning) To $45K
IMS or DB2 DBA (Gens/Design) $40K
BANKING Prog. Analyst (COBOL/MSA) . . $38K
NCP/VTAM Sys. Prog. (Prob. Solver/Tuning) $44K

Please send resume to Robert Montgomery or call 919-787-4205.

The Data Group
P.O. Box 52055
Raleigh, NC 27612

TARGET OPPORTUNITIES

Let us put our top notch staffing specialists to work for you. Hundreds of current needs include:

UNIX Internals	**to $65K**
IDMS, IMS or ADABAS	**to $50K**
MVS or VM Internals	**to $65K**
IMS DBA's	**to $70K**
UNIX/C	**to $50K**
COBOL/CICS	**to $45K**
VTAM/NCP	**to $65K**
TANDEM (TAL, COBOL)	**to $40K**
CICS Internals	**to $65K**

TARGET SEARCH, INC.
7658 Standish Place
Suite 105
Rockville, MD 20855
VOICE: 301-340-7069
DATA: 301-424-0525

Mid-Atlantic Area
Nationwide Affiliates

Sunbelt Opportunities

CICS Prog/Anal's (MVS or DOS)	30-35K
ASSEMBLER Programmers (IBM)	29-34K
UNIVAC 1100 Prog/Anal's	30-34K
VAX/COBOL Prog/Anal's	32-36K
KOMBAS/NATURAL Prog/Anal's	30-40K
TANDEM Prog/Anal's	30-36K
System 38 Prog/Anal's (RPG II)	28-36K
MAPICS Prog/Anal's (S/36 or S/38)	30-41K
IMS DB/DC Prog/Anal's	29-36K
DB2 SQL Prog/Anal's	30-40K
ORACLE SQL Prog/Anal's	29-39K
FOCUS Prog/Anal's	29-35K
MSA Prog/Anal's or Sys Anal's	30-40K
McCormack & Dodge Prog/Anal's	30-40K
IDMS/ADSO Prog/Anal's	29-35K
Bank Prog/Anal's or Sys Anal's	30-45K
Insurance (PMS) Prog/Anal's	30-45K
LotusComm. Lotus/1-2-3 Prog/Anal's	30-35K
MVS/XA Sys. Prog's	35-45K
IMS or DB2 Data Base Anal's	45-55K

Charlotte's largest executive search firm, in business since 1975. 300 affiliates. We place candidates in the Southeast and nationwide. Our client companies pay relocation and interviewing expenses, and our fees.

Corporate Personnel Consultants
3705-320 Latrobe Dr., Charlotte, NC 28211
(704) 366-1600
Attn: Rick Young, C.P.C.

SOFTWARE OPPORTUNITIES

1-800-423-5383

1989 Salary Survey

Let our National Award winning computer specialists assist you in your search. We have over 300 affiliated offices around the country ready to work for you!

LIFE INSURANCE	To $60K
UNIX INTERNALS	To $60K
SYSTEM/38	To $40K
IDMS, IMS or ADABAS	To $50K
P/A (COBOL or ALC)	To $40K
UNIX/C	To $45K
MVS or VM INTERNALS	$ OPEN
ACF/VTAM/NCP	To $50K
DB2/SQL	To $60K
COBOL/CICS	To $40K
Software Engineers	To $60K
OVERSEAS	$ Open

ROBERT SHIELDS & ASSOCIATES
P.O. Box 890723, Dept. C
Houston, Texas 77289-0723

Contract Programmers

Houston and New Orleans

- IDMS/ADSO
- FOCUS
- SQL/DS
- TELON
- DB2

If you have more than 1 years experience in one of the above send resume to:

Nola Computer Services
2900 Energy Centre
1100 Poydras Street
New Orleans, LA 70163
Or call (504) 585-7319 and ask for Stan

---

digital™

D A T A B A S E S Y S T E M S

"Go East or West to move up in database."

There are two places to move your career forward in database systems development.

In the West — with Digital in Colorado Springs *— we have some of the top technical people in database software development working on highly-sophisticated projects. Nestled in the foothill of Pikes Peak, you'll find low cost of living, good schools, outstanding outdoor recreational activities and small-city living.*

In the East — with Digital in Nashua, New Hampshire *— is our largest software development environment — where Digital is engineering the products which represent the world's largest installed base of relational database products on VAX*. This is the focal point of futuristic database technologies that are under development now. Only 45 minutes from Boston, Nashua represents the "best of both worlds" . . . rural lifestyle with easy access to big city convenience.*

Database Product Development Colorado/New Hampshire

We develop the internals of database products such as Rdb/VMS*, Database Distributor and SQL. We are also developing the next generation of high performance, extended relational database systems using state-of-the-art technologies. We are focusing on the design and development of the industry's most advanced and versatile database products.

Database product development openings require a BSCS or MSCS or equivalent, at least 5 years' related experience, and a strong knowledge of database product internals and VMS* or UNIX** internals. Current openings include Product Development Managers, Principal Software Engineers and Project leaders.

- **Database Run Time Systems (Colorado/New Hampshire)**
  Require knowledge of database system internals including concurrency control (locking), storage management (global buffering), query optimization, recovery, access methods, parallelism and SQL.
- **Distributed Database Products (New Hampshire)**
  Requires experience in distributed query optimization and development of a VAX/VMS based server. VMS kernel experience a plus.
- **Multi-Vendor Interoperability (New Hampshire)**
  Requires strong knowledge of VMS, Rdb/VMS, CICS, DB2, BAL, IMS, MVS or database internals.
- **Database Security (New Hampshire)**
  Requires a strong knowledge of DoD's, TCSEC security requirements, database systems internals and VMS.
- **Database Languages (New Hampshire)**
  Database or parsing, lexical or semantic analysis and semantic data models.
- **Object-Oriented Databases (New Hampshire)**
  Design methodologies, user interfaces, windows and incremental compiler construction.
- **Database Tools (Colorado/New Hampshire)**
  Distributed and physical data-driven aids, implementation and operational tools.
- **Database Standards (New Hampshire)**
  Representation on ISO/ANSI committees. Establish strategy for multi-vendor interoperability of distributed database systems.

Database Architecture Colorado/New Hampshire

Define the architecture and high level design for the industry's most advanced and versatile database products, which are outlined above. Requires depth and breadth of database technical expertise.

Database Performance Analysis Colorado/New Hampshire

Through performance measurement and modeling, study existing products and designs of future database products to ensure leadership in database performance for Digital. Experience in performance testing, workload characterization, simulation or analytic modeling required.

Choose directions, West or East. Either way, you'll be joining a team that's developing the next generation of database products-Digital. Send your resume now, indicating your geographic preference to:

For openings in Nashua, NH: Christine J. Baker, Digital Equipment Corporation, Dept. 0320 9804, 110 Spit Brook Road, Nashua, NH 03062.

For openings in Colorado Springs, CO: Michael Johnston, Digital Equipment Corporation, Dept. 0320 9804, 1175 Chapel Hills Drive, Colorado Springs, CO 80920.

We are an affirmative action employer.

Digital has it now.

*Trademark of Digital Equipment Corporation.
**Trademark of American Telephone and Telegraph Company

SOFTWARE PROFESSIONALS

Computer People Unlimited is Wisconsin's largest locally owned computer-related professional services firm — a direct result of our highly motivated professionals and our dedication to professional excellence. We currently have opportunities available in the Fox Valley, Milwaukee and Madison.

Opportunities exist for individuals with experience in any combination of the following: COBOL, PL/1, ASSEMBLER, FOCUS, NATURAL, IMS/DB, IDMS, ADABAS, DB2, IMS/DC, CICS, ADS/O, RPG III, RPG II, 4680 terminals, S/36, S/38, AS/400, TELON, and MVS/VSE/VM systems programming. In addition, positions are available for individuals with Honeywell, PC or other 4th generation language experience.

We also offer you the opportunity to become involved in developing software for 16-Bit and 32-Bit microprocessors using 'C' and UNIX. We prefer experience in the writing of device drivers and the interfacing of minis and micros, but will consider other complex scientific applications experience.

At CPU you can expect a highly competitive salary and a superb benefits package — not to mention the lakes, scenery and cultural attractions of Wisconsin. Please call Bill Rudd or Scott Fleischmann, at (414) 278-8884 or 1-800-527-8462, or send your resume in confidence to Bill or Scott at CPU, Dept. CW-312, 744 N. 4th Street, Milwaukee, WI 53203. No entry level positions available. We are an equal opportunity employer.

CPU
COMPUTER PEOPLE UNLIMITED INC.

DIRECTOR OF DATA PROCESSING

SALARY RANGE
$57,158 TO $74,303
METROPOLITAN DENVER

The position is responsible for planning, designing, and managing all automated data processing for a Federal power marketing administration of the Department of Energy. The ADP system covers 15 states in the Western U.S. The Director manages a budget of $11 million, a Federal staff of 16, and contractor operation of 100+ employees. The Federal Government offers comprehensive employee benefits. Salary will be set commensurate with experience and qualifications.

For more information on this position contact:

Barbara Martinez at (303) 231-1502
Western Area Power Administration
P.O. Box 3402, ATTN: A1222
Golden, CO 80401

The Western Area Power Administration is an Equal Opportunity Employer

Join the best little consulting firm in the nation! Technalysis has been included in Forbes' list of "The 200 Best Small Companies in America" for 5 of the last 6 years.

We provide an excellent opportunity to grow for self-motivated, dependable, full time salaried employees with a good attitude and excellent interpersonal skills.

Technalysis has immediate openings for qualified personnel to develop AS/400 products and tools, including state-of-the-art research, design, development and testing projects.

Qualified candidates will have at least 2 years experience in SYS/38 application development, testing or software engineering. Relocation to sunny Minnesota required.

TECHNALYSIS CORPORATION

Providing High Quality Data Processing Products and Services Since 1968.

WASHINGTON D.C.
7700 Leesburg Pike
Falls Church, VA 22043
(703) 821-3911

MINNEAPOLIS
6700 France Ave.
Edina, MN 55436
(612)925-5900

DETROIT
20100 W. Civic Center Dr.
Southfield, MI 48076
(313) 352-2440

Equal Opportunity Employer

ASSISTANT MANAGER
Computer Systems Group

Our expanding responsibilities have created an opening for an Assistant Manager. This group supports four essential activities at the Lab: central computing; personal computing; networking; and telecommunications. The facility consists of two Amdahl 5890-180E's and an IBM 4381, local and area networks, digital PBX, PC Resource Center, and infrastructure support for administrative information systems.

The person we are seeking will:

- Generate new concepts for computing facilities based on evolving computer and communications technology
- Provide supervision for development or acquisition, installation, operation, and maintenance of major new systems and services
- Prepare budgets, control expenditures, and participate in personnel and general administrative functions

The successful candidate will have a minimum of fifteen years of direct experience with computer operating systems, computer operations, networking, and voice and data communications; with at least five years of significant supervisory or management responsibility in computing or telecommunications. Must be systems oriented and interact effectively with all levels of users and management, both within the Laboratory and among vendors, outside agencies or organizations. Large IBM systems experience is preferred.

Interested candidates are invited to forward their resumes to Rosemary E. Malvermi, CW3 , MIT Lincoln Laboratory, 244 Wood St., Lexington, MA 02173.

An Equal Opportunity Employer
U.S. Citizenship Required

MIT LINCOLN LABORATORY

DIGI-KEY CORPORATION

CONCURRENT COMPUTER CORPORATION *Professional*

Digi-Key Corporation is seeking a data processing professional with experience on CONCURRENT COMPUTER CORPORATION (previously PERKIN-ELMER) machines. Knowledge of OS32 operating system, hardware, and assembly language is desired. A master's degree in electrical engineering or computer science is preferred, but motivated individuals with a bachelor's degree would be considered. A salary in the range of $35,000 to $50,000 depending on education and experience, three weeks of paid vacation, plus an excellent benefits package are offered for your service.

Digi-Key is a rapidly expanding mail order distributor of electronics components serving a national market since 1972. We are located in northwestern Minnesota near excellent recreational opportunities including fishing, big game hunting, skiing, snowmobiling, and much more. Our town is large enough to provide a good educational system and cultural opportunities yet small enough to offer a rural lifestyle.

DIGI-KEY CORPORATION
Keith Stava
701 Brooks Ave South
Thief River Falls, MN 56701
Phone: 218-681-6674

TRANSPORTATION SYSTEMS ANALYST AND DESIGNER: To analyze transportation problems relating to auto traffic in post-disaster situations, create computer simulation and find solutions based on Artificial Intelligence techniques. Compensation $44,000 per year. Hours of work 9 A.M. to 5 P.M. Interested candidates must possess graduate degree (M.S.) in computer science and graduate degree (M.S. or Ph.D.) in civil engineering with concentration in transportation, must have done research in transportation and have a minimum of 18 months experience as a transportation engineer with computer applications. Publication in this field desired, but not necessary. Submit resume or c.v. to the Phila. Job Bank, 444 N. 3rd St., 3rd Fl., Phila., PA 19123. Job Order #4237117.

The Florida State University
Tallahassee, Florida

Systems Project Administrator #61137

Qualifications: Bachelor's degree from an accredited college or university and four years of and/or computer programming (excluding micro/personal computers). Experience in financial aid applications and IBM mainframe preferred.

Salary Range: $28,888 to $48,849 annually

Application Deadline: April 6, 1989

How to Apply: Submit two copies of the Florida State University employment application to: **Florida State University Personnel Relations, 216 William Johnston Building, Tallahassee, FL. 32306-1001.** * To obtain applications call (904/644-6034). Florida State University is a AA/EEO.

PROGRAMMER ANALYST II

Attorney's Title Insurance Fund, Inc., one of Florida's largest computerized title insurance companies, has an immediate opening for a Programmer Analyst II, at our state-of-the-art facility in Orlando. Those applying should have at least 5+ years' experience in ASSEMBLER, COBOL, COMMAND & MACRO level CICS, VSE & VSAM.

All interested applicants, send resume with salary history to:

Personnel Services
Attorney's Title Insurance Fund, Inc.
P.O. Box 628600
Orlando, FL 32862-8600

PROGRAMMER/ ANALYSTS

So. Calif. Pacific NW

Consulting positions available for qualified candidates with the following skills:

- IDMS/DB
- COBOL
- ADS/O
- DB2

For immediate consideration please contact:

Mike Ford
Advanced Systems Group
219 First Ave. North
Suite 134
Seattle, WA 98109
(206) 281-9183

SENIOR STORAGE MANAGEMENT TECHNICAL SPECIALIST

Our Centralized Storage Management Group offers high-order challenge to the individual who can provide the necessary technical leadership to support MCI® growth into the 90's. Evaluating and implementing the latest hardware and software technologies to support rapid business growth from an already substantial base, you will be expected to help set our Storage Management direction for the future.

You will be responsible for achieving an enhanced data storage environment for multiple, extremely large data centers, utilizing DF/HSM and related storage management products. Your functions will include design, development and implementation of computer-based tools to measure and characterize operating deficiencies within the storage management environment, and formulating plans for improvement.

QUALIFICATIONS INCLUDE:

- ☐ 8+ years in a systems programming/technical support role in very large MVS environments.
- ☐ Thorough familiarity with 3090 and MVS/XA architecture, especially DFP and related subsystems.
- ☐ Previous responsibilities involving implementation and operation of DF/HSM and related products, know DF/HSM operating characteristics, SMF records, and CDS record types.
- ☐ Strong Assembler skills and fluency in MICS and SAS programming.
- ☐ Background in MVS Dasd Tuning, capacity planning, and statistical skills desirable.

For immediate consideration, please send your résumé and salary history in confidence to: **Human Resources, MCI Telecommunications Corporation, Dept. 1126/GCW-01, 601 South 12th Street, Arlington, Virginia 22202.** An Equal Opportunity Employer M/F/H/V.

MCI
Let us show you.™

Be part of CTG's Elite

Computer Task Group's IBM Relational Consulting Practice is undergoing a major expansion. We have gained our excellent reputation by providing quality services to many of America's leading corporations. Our clients are provided with competitive advantages through the application of technology, specifically IBM's Application Enabling Product suite.

Our Product Group provides high level consulting services to clients in partnership with our 70 branches worldwide. We need motivated enthusiastic and experienced professionals who possess a background in IBM's Relational DBMS's and surrounding products **(DB2, SQL/DS, OS/2EE, SQL/400, QMF, AS, CSP, etc.)**. Our services include:

- **Product Evaluation**
- **Product Installation**
- **DBMS Migration Support**
- **Pilot Project Support**
- **Database & Application Design**
- **Remote Development**
- **Performance Tuning**
- **On-site Education**
- **Design Reviews**
- **Seminar Delivery**
- **IBM Business Partner Support**

CTG offers very competitive salaries and benefits. To assist our staff in continuing professional development we have a multi-million dollar Institute for Technical and Management Training that we feel is unique in our industry.

Relocation is not essential, but extensive travel is required. For consideration and complete confidentiality, please forward your resume to:

Ms. Margery Staich • 4919 Memorial Hwy
Suite 230 • Tampa, FL 33634
Equal Opportunity Employer

CTG
COMPUTER TASK GROUP

We Speak Your Language.

FLORIDA
The Perfect Climate For Professional Growth

We are Romac & Associates, specialists in the data processing industry. Currently our technically sophisticated clients have requirements for the following:

- PROGRAMMER ANALYSTS
- SYSTEMS ANALYSTS
- SYSTEMS PROGRAMMERS
- DATA BASE ANALYSTS
- SOFTWARE ENGINEERS

WHO HAVE EXPERIENCE IN ANY OF THE FOLLOWING AREAS:

- IBM-MVS
- CICS
- COBOL
- ASSEMBLER
- TANDEM/TAL
- IMS
- IDMS
- DB2
- MODEL 204
- C
- SYSTEM 38
- AS-400
- RPG III
- FOCUS
- INGRIS

Our clients offer top salaries and a perfect climate. Please send resume or call any of our Florida locations.

•TAMPA	•FT. LAUDERDALE	•ORLANDO	•JACKSONVILLE
1 Harbour Place	5900 N. Andrews Ave.	111 N. Orange Ave.	6 East Bay St.
#880C	#900C	#1150C	#510C
Tampa, FL 33602	Ft. Lauderdale, FL 33309	Orlando, FL 32801	Jacksonville, FL 32202
(813) 229-5573	(305) 928-0611	(407) 843-0765	(904) 358-4808

ROMAC.

Professional Recruiters
All fees are assumed by our client companies.

PROGRAMMER/ ANALYST SYSTEM 3/X

As the world's largest winery, Gallo can offer you more than most other companies: Excellent compensation and benefits, responsibility and visibility, and the opportunity to work in Central California's beautiful San Joaquin Valley, just 45 minutes from the Sierra Nevada Mountains and 90 miles east of San Francisco.

This position requires a thorough knowledge of both Systems/36 and 38 in a structured programming environment, with three to five years' hands-on experience. Emphasis will be placed on technical depth and the ability to work both independently and as a team member. You will assist in the design, implementation and on-going support of multiple distribution systems installed throughout the country. The person selected will be a major contributor to a centralized systems and programming department. We are an IBM industry remarketer with an AS/400 development system in place.

Please send resume and salary history, in complete confidence, to:

Professional Staffing
E. & J. Gallo Winery
P.O. Box 1130
Modesto, CA 95353

E. & J. GALLO WINERY

An Equal Opportunity Employer. M/F/H.

At Tandem, You Can Make a Difference.

DATA COMMUNICATIONS OPPORTUNITIES

From Main Street to Wall Street and around the globe, Tandem is unleashing the power of information, breaking through the Data Communication barriers, and making complex information instantaneously accessible for companies that need enterprise-wide networks.

As a world leader in fault-tolerant computer systems and networks for on-line transaction processing (OLTP), Tandem offers a stimulating environment of interactive involvement, where you will develop some of the newest data communications technologies. Our team environment promotes interdepartmental idea exchange, open lines to management and clearly defined goals and rewards.

Consider these opportunities located in Silicon Valley, CA.

SOFTWARE DESIGNERS AND PROGRAMMERS

We are looking for talented software designers and programmers to participate as key members of a development team designing the next generation of Tandem data communications products. Specific openings are for designing, prototyping and testing a new software communications environment for data communications protocols:

■ Systems Designer ■ Environment prototype and development ■ Protocol prototype and development ■ Test bed development and prototype verification

All openings require a minimum of 4–5 years of experience as a software designer/programmer with communications background emphasizing data communications protocols. Experience with C required. BSCS or equivalent experience required.

MEMBER OF TECHNICAL STAFF –DataComm Development–

We are looking for a Senior Individual Contributor to join our DataComm WAN Access Method design team. You will be responsible for maintenance, support and enhancement of Tandem WAN products insuring project objectives are met in a timely manner. In addition you will participate in and conduct code reviews.
There will be specific emphasis on application and protocol support for IBM 3270 emulation, ASYNC terminal emulation, I/O controller download modules, and proprietary communications drivers.

Requires a BSCS or equivalent experience and a minimum of 5 years' industry experience in software programming. Your background must include at least 2 years development/maintenance experience with IBM BISYNC 3270 emulation and/or ASYNC terminal products, I/O processors, Cluster Controllers, or IBM compatible Transmission Control Units. Indepth knowledge of the development process is also required. Knowledge of PASCAL, C, and ASSEMBLER is a plus as well as TAL and GUARDIAN programming.

SOFTWARE DESIGNERS

■ **Distributed Systems Management**

Maintain and enhance the family of products that implement our Event Management Service (EMS). Major enhancement development includes design, external and internal specifications and implementation. At least 6 years' in software development experience, ideally in OS or network management, is required. Demonstrated ability to manage projects and understanding of the software development lifecycle is essential. Knowledge of Tandem products a plus.

■ **SNA Software Developer**

You will be responsible for designing, coding, testing and documenting software for the SNAX/XF product. This will include preparing product requirements, external and internal specifications, and development test plans. The ideal candidate should have the ability to take on a technical leadership role and help lead other section members in an effort to improve product quality as well as work with QA and publications. A BS or equivalent in Computer Science and a minimum of 5–8 years' in software development is required. Background as a project leader and experience with SNA protocol is preferred.

SECTION MANAGER

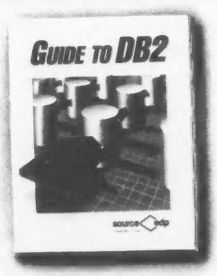
Working on our SNAX products, you will oversee all aspects of software QA. Your primary responsibility will be to ensure schedules are met with high quality products. This will entail developing schedules, troubleshooting, and providing technical direction on testing strategies, plans, specifications, and libraries. We require a BS in Computer Science or equivalent and 7 years' industry experience with at least 5 years' in software development or QA. Previous project management experience plus working knowledge of SNA or SNAX protocols essential.

SOFTWARE QA PROJECT LEADER

We are looking for a project leader to manage Quality Assurance for OSI electronic messaging, X.400 system. The group will review product documentation, generate tests, conduct multi-vendor network validating and review developers' design and code. Requires X.400 familiarity, quality assurance expertise and technical management experience with a minimum BSCS, or equivalent, and 7 years industry experience and data comm software.

Tandem Computers offers an outstanding compensation and benefits package, including relocation assistance, with a very progressive work environment. To apply, please call or send your resume (BE SURE TO INDICATE REF.# DCCW320 ON YOUR RESUME AND ENVELOPE) to Wayne Hoyt, 1-408-285-0037, Tandem Computers Incorporated, 10600 Ridgeview Court, MS 229-17, Cupertino, CA 95014-2599. We are an equal opportunity employer m/f/h/v.

TANDEM
Where outstanding people develop together.



FREE! DB2 GUIDE!

If you're in programming, systems analysis or design—and you plan to use DB2—our latest ***Guide to DB2*** could help make things easier.

Guide to DB2 is written in a clear, concise format to aid busy professionals. It's the perfect way to review critical data on DB2 architecture, objects, Structured Query Language and more. In less than 25 pages, you'll have a good start towards a more complete understanding of how you can use DB2 in your applications.

Call 1-800-392-7900, ext. 110
(In Canada call: 416/977-7957)

Call anytime 7 days a week for your free copy.
Or write: Department NU1, P.O. Box 7571, San Mateo, CA 94403-7571.

source edp
Computer Recruiting Specialists

CONTRACT PROGRAMMERS
WITH A MINIMUM OF 4 YRS EXP.

Up to $35 per hour

IMS/DB/DC
SQL, DB2, ADF
TELON, IDEAL
ADR/DATACOM
ADABAS/NATURAL
IDMS/ADS/O/CICS
MSA EXPERT
McCormack & Dodge
PRIME 9000
INFO/BASIC
IBM SYSTEM 36/38
UNISYS, ADA
FORTRAN, GKS
DEC, VAX
POP-11, FMS

FOCUS NOMAD & MANTIS
Systems Programmer
DOS/VSE Hou.
Data General
FORTRAN 77
Numerical Control Programmer

We have openings in CA, TX, LA, MO, OK, IL, OH, MI, NC, VA, and West VA.

J.P.S. INC.
P.O. Box 890007
Houston, TX 77289-0007
(713) 820-0024
Fax (713) 376-6431

No trainees or part-time positions
Equal Opportunity Employer

Financial Systems Consultants
$30,000 - $75,000+

Positions exist **NATIONWIDE** at all levels for individuals with **IBM** "hands-on" technical or functional experience with any of the following products:

- McCormack & Dodge
- Computer Associates/UCCEL
- Management Science America
- Tesseract
- INGRES
- ORACLE
- CASE Tools
- Genesys

Join the exciting field of consulting with a prestigious **"BIG EIGHT"** firm. Top salaries and benefits are available in most major cities. Send resume to:

Donald C. Thomas
& Associates, Inc.
1211 N. Westshore Blvd. #802
Tampa, Florida 33607
Specialized IBM Personnel Services

KENDA SYSTEMS, INC.
BOSTON ● NEW YORK ● [illegible]INGTON

SOFTWARE CONSULTANTS

KENDA SYSTEMS provides consultants to the East Coast High Tech Community. Talented professionals with these skills are welcome to register with KENDA SYSTEMS.

- *ADA SWE/DSGN-CODE-TEST
- *CSP/CICS AND DB2
- *PL/1-ISPF/CICS OR DB2
- *SUN/C/FIN'L OR SCIENTIFIC
- *STRATUS/ANY LANGUAGE
- *S/P CONVERSION TO VM/XA
- *S/P CONVERSION TO MVS/ESA
- *TANDEM/TAL/FIN'L OR COMM
- *VAX/C AND SQL/COMM
- *S/Ps/RACF OR VTAM/NCP
- *AS OR SYBASE OR CPCS
- *WINDOWS/C/MULTITASK OR OS2

Forward resume to Roz McKinnon.

50 E 42nd St., Ste. 1508, NY, NY 10017 212/599-6969

COMPUTER CAREERS

Software Design & Development, Inc.
454 South Anderson Rd
Rock Hill, SC 29730
1-800-634-8086
FAX 1-803-329-1331
The UNIX® Specialists

Software Engineers*
Unix/C
Communications • Telephony • Database Internals • Hardware • UNIX Tools
• Florida • Texas • Illinois •
• North Carolina • Ohio •
Call us or FAX your Resume for our immediate response
*2 years additional experience

MAINE - NH

We have specialized in data processing professional placement in Maine & NH for a quarter of a century. If you qualify for positions in the $25,000-$50,000 range, please contact us in total confidence. Our clients pay our fees and provide relocation assistance.

ROMAC.
Att: Dept. 2
P.O. Box 7040DTS
Portland, ME 04112
(207)773-4749

DEC SYSTEMS PROGRAMMER
To $40,000

Expanding DEC VAX environment seeks another Systems Professional with 2+ years of VAX support experience. Will support a DECNET and several DECX machines. Relaxed environment with opportunity to work on a diverse number of projects. Excellent benefits and relocation package.

ROBERT HALF
DATA PROCESSING
7733 Forsyth Blvd.
St. Louis, MO 63105
(314) 727-1535
FAX: (314) 727-1321

CONSULTANTS CONTRACTORS EMPLOYEES
Human Resources, Payroll/Personnel CICS/VSAM, DB2

Please send RESUMES to: Integral Systems, Dept. PS, 2185 North California Blvd., Walnut Creek, CA 94596.

Principals only please. We are an equal opportunity employer.

CA & AZ CONTRACTS

CONSULTANTS WANTED

PMI
P. Murphy & Associates, Inc.
4405 RIVERSIDE DRIVE, SUITE 100
BURBANK, CA 91505
(818) 841-2002 (714) 552-0506
FAX: (818) 841-2122

SYSTEMS ANALYST for distributor of hardware & software systems in north Ohio to study user requirements; prepare time, cost, & technical feasibility report for development of new software package; system design, development, & implementation using Data General Eclipse MV-4000 hardware & ICOBOL, Command Line Interpreter (CLI), Advanced Operating System (AOS/VS), Index File Organization Structure (INFOS), DG/L, PROXI program generator software; & prepare System & Program documentation. Must have B.S. in Computer Science & 2 years experience in the job described. 40 hrs/wk. 8am-5pm. $29,165/yr. Qualified applicants reply by resume to C. Bussard JO#1064420, Ohio Bureau of Employment Services, PO Box 1618, Columbus, Ohio 43216.

Consulting Opportunities

Programmers, Designers, Analysts, DBA's, Technical Writers, System Analysts, Administrators, Engineers sought for per diem and permanent positions.

- IBM, SQL
- CICS, IDMS
- IMS
- COBOL
- PLI
- FOCUS
- NOMAD
- ADABAS/NATURAL
- UNIX, (Appl. & Int'ls)
- [illegible]
- C
- SYBASE, ORACLE
- IDEALADB
- VAX/VMS
- TANDEM
- TPF
- PC's
- DESIGN ENGR'S
- SOFTWARE ENGR'S
- HARDWARE ENGR'S
- MECHANICAL ENGR'S

Other positions also available. Please call or send resumes to:

Structured Logic Systems, Inc.
2470 Windy Hill Road, Suite 264, Atlanta, GA 30067
Two Penn Plaza, Suite 1540, New York, NY 10121
1-800-537-1152
Must Have Minimum Two Years Experience.
GEORGIA • NEW YORK • NEW JERSEY • TEXAS • MASSACHUSETTS • DC

PROGRAMMERS
Contract Assignments
$25-30 Per Hr.+

Jr. to Sr. level programmers with 1+ yrs. exp. in IBM & other languages (PASCAL, "C," ASSEMBLER, PL-1, etc.) Contract assignments 12 mos. + $25-30/hr. + benefits package. *In confidence, contact Al Abraham, CEC.*

CORPORATE PERSONNEL CONSULTANTS, INC.
3705 Latrobe Drive, Suite 310
Charlotte, NC 28211
(704) 366-1800

Northern California
EXCLUSIVE POSITIONS
Contract & Permanent
IDMS, CICS, IMS
VAX-RDB
* Sr. Prog. Analyst
* Sr. Bus. Analyst
* Project Managers
* Systems Programmers
* Data Base Analysts
* Technical Editors
Chuck Klein & Assoc.
3840 Thorson Dr.
Placerville, CA 95667
(916) 644-6396

DIRECTOR OF DATA PROCESSING

Kent County, Michigan is seeking a Director with responsibilities for overall implementation and maintenance of a centralized Data Processing Department which provides comprehensive systems and programming support to 15 County Departments plus limited service to 21 townships, 7 cities and 5 villages. Systems include Financial Administration, Personnel/Payroll, Property Tax Administration, Child Support Case Management, Criminal Justice, Public Health and Mental Health. The DP budget is $2 MM with 24 prof/tech staff and operates on IBM 4361, IBM 9370, HP-3000/68, HP-3000/70.

Requires Bachelor's degree in related field or equivalent experience and minimum 5 years successful and progressively more responsible project manager or administrative experience. Prefer governmental DP experience and knowledge of County provided services.

Kent County has a comprehensive benefit package and will offer a starting salary dependent on qualifications and experience. For more information and an application package call or write the Kent County Personnel Department, 300 Monroe N.W., Grand Rapids, MI 49503. (616) 774-3414. EEO Employer.

Pacific Northwest Opportunities

- PA - Unix and Relational DB 38K
- CICS Sr P/A 37K
- Consultant IMS/DB2 49K
- IDMS P/A's 41K
- Oracle P/A 38K
- Team Lead (IBM & Medical) 40K
- PA's (Banking Exp) 36K
- PA-C & Unix 39K
- Sr P/A-MSA & G/L 42K
- Business Analysts - Retail 46K
- DB2 & IMS PA 37K
- PA-Pick & Basic 36K

VanderHeuvel & Associates, Inc.
317 SW Alder, Suite 1245
Portland, Oregon 97204
(503) 299-6811

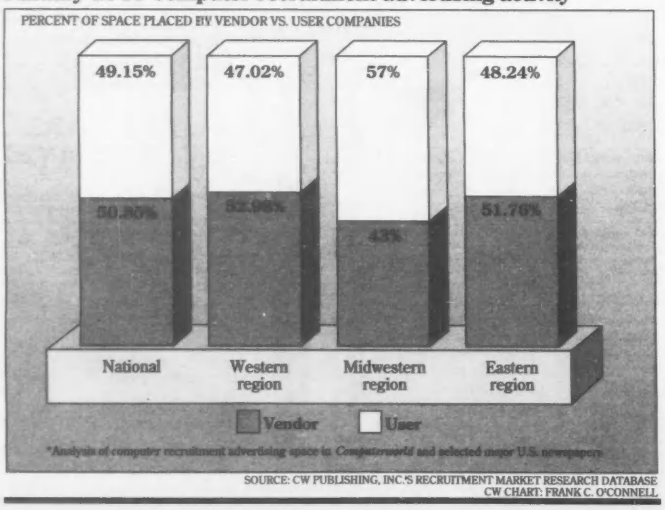
CHIEF OPERATING OFFICER
200 K 1st Year Potential

Major Corporation relocating to the west coast is in need of CHIEF OPERATING OFFICER. Company offers excellent base salary and bonus plan. Company is a high tech organization that develops fault tolerance systems for UNIX based computer systems. For more information call Steve Leech at 704/455-3612 or send resume to:

VISTA COMPUTER SERVICES
Smith Tower Hwy 29 N Suite 330
Harrisburg, NC 28075

CAREER INDEX

January 1989 computer recruitment advertising activity*



*Analysis of computer recruitment advertising space in *Computerworld* and selected major U.S. newspapers

SOURCE: CW PUBLISHING, INC.'S RECRUITMENT MARKET RESEARCH DATABASE
CW CHART: FRANK C. O'CONNELL

It's the efficient way to recruit qualified computer professionals.

Now you can target your recruitment advertising to the qualified computer professionals you want to reach - where you want to reach them. All you need is the new IDG Communications Computer Careers Network. Here's how it can work for you:

You choose the newspapers. Depending on who you're looking for, you can select the combination of five newspapers that best suits your needs - **Computerworld, InfoWorld, Network World, Digital News, and Federal Computer Week** Editions.

You choose the region. If you wish to recruit within a specific area, you can advertise in the regional editions of the newspapers you choose - East, West, or Midwest. Of course, national buys of individual newspapers or various combinations are also available when you need to extend your reach.

You don't pay for readers you don't want. Gone are the days when you have to worry about paying for waste circulation. The Computer Careers Network puts you in touch with qualified computer professionals - and only those qualified computer professionals you need to reach.

To put the new Computer Careers Network to work for you - regionally or nationally - call the sales office nearest you. Or contact John Corrigan, Classified Advertising Director, at (508) 879-0700.

Sales Offices:

BOSTON: 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, (508) 879-0700;

NEW YORK: Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652, (201) 967-1350;

WASHINGTON: 8304 Professional Hill Drive, Fairfax, VA 22031, (703) 573-4115

CHICAGO: 10400 West Higgins Road, Suite 300, Rosemont, IL 60018, (312) 827-4433;

LOS ANGELES: 18004 Sky Park Circle, Suite 100, Irvine, CA 92714, (714) 250-0164;

SAN FRANCISCO: 18008 Sky Park Circle, Suite 145, Irvine, CA 92714, (714) 250-0164;

MARKETPLACE

CD-ROM keeps rolling along

The technology advances, but users wait for critical applications

BY BARBARA SEHR
SPECIAL TO CW

Compact disk/read-only memory (CD-ROM) technology continues to generate support from hardware and software vendors that have been adopting standards and boosting output of disk drives and programs. However, vendors need to do more to lure users who are looking for more critical applications and flexible technology.

Last year was a big one for CD-ROM, according to Robert Abraham, a market analyst at research firm Freeman Associates, Inc. in Santa Barbara, Calif. More than 91,000 drives were shipped in 1988, says Abraham, who expects the number to jump to 140,000 this year and 311,000 by 1992.

In addition, general interest applications have been emerging. Microsoft Corp. began the trend with Bookshelf — an online style checker, quotation source, ZIP code directory and statistical repository. The firm followed up with an application development tool, the Programmer's Library.

Another advance is the use of CD-ROM for software distribution. Instead of a floppy disk drive for software, Digital Equipment Corp.'s newly introduced Vaxstation 3100 comes with an optional on-board CD-ROM drive that can be used with third-party software on the market.

Despite these advances, many users are looking for more. Michael Alpert, a partner in the Montclair, N.J.-based accounting firm Gross & Alpert, describes himself as a technological pioneer. He is always one of the first to try a new technology, long before it becomes mature. His own personal computer has a CD-ROM drive, and there are others in his firm.

However, accounting, the application that would be most useful for him, is not available. Thus, much of his time on the CD-ROM drive is spent exploring the technology rather than using it in his work.

"I would love to see some of the directories we use available on CD-ROM," Alpert says. "I'm afraid, however, it's going to take some time." He still spends a lot of time leafing through online directories available via modem and looking up tax code information in huge loose-leaf binders — tasks that might be done more efficiently with CD-ROM disks.

Trial run

On another front, a trial is in progress at Jeppesen Sanderson, an Englewood, Colo., firm that makes up-to-date maps for airlines. System analyst Gary L. Porter wants to convert the company's mapping information, currently on tape, onto CD-ROM disks that could be read directly by computers aboard aircraft.

Despite apparent benefits of such a system, upper management at Jeppesen Sanderson is still trying to cost-justify the conversion. Because the maps must be revised every 28 to 56 days, the emergence of rewritable CD-ROM disks may spur a management decision for the green light, Porter says.

Porter adds that the company's managers could be further encouraged to approve the use of CD-ROM if they could find another application for the technology.

The decision to invest in CD-ROM is driven in part by hardware costs. Porter notes that the price of CD-ROM hardware is on a downward spiral typical of emerging technologies. "Our management knows that it won't cost them more money by waiting," he says.

Freeman Associates verifies this drop. In 1987, its report notes, drive prices were $500 at the OEM level. In 1989, the price dropped to $395 — about $700 at the retail level. Analyst Abraham ultimately expects the prices to drop to $250 — half the 1987 level — by 1993.

The real test of CD-ROM, however, will continue to come in applications. Steve Sieck, vice-president of electronic services at Link Resources Corp. in New York, says 869,300 disks were shipped in 1988. For 1989, he expects the number to jump to three million. In 1992, he projects that 34 million disks will be shipped to a total installed base of 1.3 million CD-ROM drives.

The selection of titles is also on the rise. Since the first title was introduced in 1985, the number has jumped to more than 450, says Linda Helgerson, president of market research firm Diversified Data Research, Inc., in Falls Church, Va. Since January, 20 new titles have already been added, she says.

Sehr is a free-lance writer based in Hayward, Calif.

Index

Marketplace 111
CD Rom 111
Used/Lease/Rent 112
Hardware 116
Software 116
Peripherals/Supplies 116
Graphics/Desk Top Pub 116
Time/Services 115
Bids/Proposals/Real Estate 116
Business Opportunities 116

Training 117

The BoCoEx index on used computers

Closing prices report for the week ending March 19, 1989

	Closing price	Recent high	Recent low
IBM PC Model 076	$650	$750	$350
XT Model 086	$1,025	$1,150	$900
XT Model 089	$1,200	$1,575	$1,000
AT Model 099	$1,725	$2,000	$1,525
AT Model 239	$1,875	$2,100	$1,800
AT Model 339	$2,100	$2,375	$1,800
PS/2 Model 30	$1,375	$1,550	$1,000
PS/2 Model 50	$2,200	$2,400	$1,900
Compaq Portable I	$625	$750	$550
Portable II	$1,900	$2,100	$1,750
Portable III	$2,900	$2,950	$2,500
Portable 286	$1,750	$1,975	$1,675
Plus	$1,050	$1,250	$900
Deskpro 286	$2,100	$2,350	$1,800
Deskpro 386	$3,750	$3,975	$3,675
Apple Macintosh 512	$650	$775	$550
512E	$775	$975	$600
Plus	$1,125	$1,225	$1,000
II	$3,900	$4,450	$3,800
Toshiba T3200	$2,900	$3,000	$2,500
Zenith 183	$1,400	$1,500	$1,000

INFORMATION PROVIDED BY THE BOSTON COMPUTER EXCHANGE CORP.

CD Rom

BUREAU OF ELECTRONIC PUBLISHING

CD-ROM The Largest Selection of CD-ROM Drives, Titles & Accessories for the PC and Mac

CD-ROM Drives (complete & ready to run)

Amdek w/audio for PC external ($699) or internal $570
Hitachi w/audio for PC external ($749) or internal 699
NEC w/audio external for PC($850) or Macintosh 799
Toshiba w/audio for PC & Mac fastest int. drive! from 850
800 MEGABYTE WORM less than $0.18 per MB! 3,695
Portable '286 w/ CD-ROM drive data to go 3,995
Also: Denon, Philips, and Sony CD-ROM drives

Drive/Title Combo's (complete)

PC Starter Set drive & 2 titles, call for details $799
Microsoft Bookshelf ($265) with internal or external drive 889
Microsoft Programmer's Library ($379) with drive 989
Computer Library with drive, "Product of the Year" 1,345

Programmers

C Library or Ada Library 1,000's of routines & programs 399
Shareware Grab Bag over 3,000 useful programs 99
Budgetbytes 300 MB in hypercard stack - Mac 189
Educorp Library over 500 disks worth of software - Mac 199
PC-Sig Library new edition, everything from disks 1-1240 465
ICP Software Directory search 15,000 hi/w & s/w items 6,000

Business

Consumer, Economic or Agricultural Stats (1913-87) 569
Computer Library essentials for MIS & PC managers 695
Material Safety Data Sheets over 50,000 chemicals 750

Attorneys & Government

Constitution Papers 43 documents from US history 565
Pravda full English translation from 1986-87 249
Geovision U.S. Atlas entire U.S. with 1 million landmarks 595

Desktop Publishing & Graphics

NEC Clip Art/Image Folio 1000's of images - PC & Mac $369
Kwikkee Pro-Art 300 Postscript illustrations - PC & Mac 375
Comstock Desktop Photo. 449 photos - PC & Mac 449
ArtRoom fonts, art, templates, utilities, and more - Mac 949

Libraries and Education

Science Helper K-8 1,000 NSF lesson plans $195
McGraw-Hill Ref. Set 100,000 terms; 7,300 articles 245
Grolier's Encyclopedia 20 volumes, 30,000 articles 345
News Digest current events 1985-87 - PC & Mac 695
Oxford English Dictionary over 250,000 headwords! 940

Medicine & Science

Time Table of Science stack with 5,500 events - Mac $149
Physician's Desk Reference official data, 2800 drugs 595
CD-Gene search through GenBank, EMBL, PIR with FASTN 750

Miscellaneous

Sherlock Holmes for all 221B Baker Street fans 565
King James Electronic Bible full text, easy to search 69
Between Heaven and Hell practical and personal 99
Bible Library 9 bibles, 30 references, 27 concordances 495

MORE! Over 100 different CD-ROM titles

Free subscription to *CD-ROM End User* with every order!
Free CD-ROM Sourcedisk with every dollar over $1,000!
PO's & COD's accepted from qualified organizations
Money back guarantee
Free technical support

Bureau of Electronic Publishing, Inc.
18 Louisburg Square, Dept O, Verona, NJ 07044 Fax # 201-746-3034
Dealer Inquiries Welcome
(201) 857-4300
The Source for CD-ROM

CLASSIFIED MARKETPLACE
Where Computer Professionals Shop
(800) 343-6474
(508) 879-0700

Your Advertisement For:
- Used/Lease/Rent
- Hardware
- Software
- Peripherals/Supplies
- Communications
- Graphics/Desktop Publishing
- Time/Services
- Bids/Proposals/Real Estate
- Business Opportunities

can appear here...
in **CLASSIFIED MARKETPLACE** computer professionals go shopping each week
(800) 343-6474 (In MA., (508) 879-0700

Used/Lease/Rent

IBM SYSTEM 36/38 SERIES 1 SYSTEM AS/400 4300
• Lease • Trade
MEMBER OF CDLA
* SPECIAL LEASE RATES ON NEW AS/400's
• Buy • Sell • New • Used
800-6789-IBM
2 Faraday, Irvine, CA 92718
714/770-2122 / FAX: 714/770-5441
MEMBER OF WAEL

We Buy, Sell & Lease IBM Processors and Peripheral Equipment
DASD: 3380 3375 3370 9335 Immediate Delivery
CPU's: 4381 4361 9370 4341 Sale/Lease
Tape Drives: 3480 3430 3422 3420 Immediate Delivery
Display Stations: 3191 3180 3192 3179 3196 3178 Immediate Delivery
Controllers: 3990 3745 3174 3880 3725 3803 Immediate Delivery
Printers: 4245 3262 3800 4248 3203 3812 Immediate Delivery
Computer Marketing Inc.
PO BOX 0 MARGATE NJ 08402 0430
609/823-6000
Contact/Bernie Gest
Telex: 5106012293
Established 1969
CDLA

VAX RENTALS
MV 3500/3600
MICROVAX II
VAX 6000 SERIES
VAX 8000 SERIES
Systems & Peripherals
• Fast Turnaround
• Dependable Products
• Upgrade/Add-On Flexibility
6 Months • 12 Months • 36 Months
BROOKVALE ASSOCIATES
ddb Digital Dealers Association
EAST COAST (516) 273-7777
WEST COAST (206) 392-9878

BUY * SELL * RENT * LEASE
3178 3174 3262
3179 3274 3268
3180 3276 3287
3191 3278 4224
3192 3279 4234
Large inventory.
Quick delivery.
Most models and features in stock. All machines refurbished.
URS
URS Information Systems, Inc.
One Pope Street
Wakefield, Ma. 01880
617-438-4300
CDLA Member

NEW ADM™ TERMINALS
FACTORY DIRECT FOR LESS!
ZENTEC Corporation, manufacturer of the ADM terminals (previously manufactured by Lear Siegler), now offers these Models factory direct to you for less!
ADM3E ADM11 ADM11plus
ADM12 ADM12plus ADM1178 ADM220
CALL 800-332-5631 Outside CA or 408-727-7662 X596
FOR PRICING & IMMEDIATE DELIVERY!
FOR PROMPT SERVICE/SUPPORT CALL DOW JONES SERVICE COMPANY AT 800-532-7373
ZENTEC

HONEYWELL
LEVEL 6 DPS 6 SERIES 16
• Complete Minicomputer Line New & Used
• All Peripherals and Terminals
• Upgrades and Features
• Depot Repair Capability
• Honeywell Maintenance Guaranteed
• Immediate Delivery Low Prices
• HDS 5 and HDS 7 Compatible Terminals
The Recognized Leader in Honeywell Minicomputer Sales and Support
BCS
BOUDREAU COMPUTER SERVICES
100 Bearfoot Road
Northboro, MA 01532
(508) 393-6839
FAX 508-393-3781

AS-400 TOTAL SUPPORT SELL-LEASE
OPTIONS GROUP
800-426-5377
612-941-1099
10340 Viking Drive
Eden Prairie, MN 55344

BUY • SELL • RENT • LEASE
MEMOREX — TELEX
TERMINALS • PRINTERS CONTROLLERS
MODELS: 078, 079, 178, 179, 275, 277, 278, 287D2, 387
CALL: PETE DOCKTER
LEASING ASSOC. CORP.
177 SOUND BEACH AVE.
OLD GREENWICH, CT 06870
CDLA (203) 637-8500

IBM SPECIALISTS
SELL • LEASE • BUY
S/34 S/36 S/38 AS/400
3741 3742
• New and Used
• All Peripherals
• Upgrades and Features
• IBM Maintenance Guaranteed
• Immediate Delivery
• Completely Refurbished
800-251-2670
IN TENNESSEE (615) 847-4031
CMA COMPUTER MARKETING of America, Inc.
PO BOX 71 • 610 BRYAN STREET • OLD HICKORY, TENNESSEE 37138

RT
937X
Series/1
AS/400
System 36, 38
4300
Buy, Sell, Lease, Rent
612•942-9830
All IBM Machines and Parts
DATATREND Inc.
10250 Valley View Road
Suite 149
Eden Prairie, Minnesota 55344

DEC
BUY SELL
VAX, MICRO VAX II, III, PDP
• Systems
• Peripherals
• Modules
Hard to find items our specialty
Call George H. Trawinski
Int'l Computer Exchange Ltd.
(617) 585-9688
FAX: (617) 585-9177
NEW USED

Computerworld's
Classified Marketplace
gives you reach to over 612,000 potential buyers!
And this audience is even verified by the Audit Bureau of Circulations in the only independently audited pass-along survey of its kind. What's more *Computerworld's* Classified Marketplace penetrates buying companies in all major industries. That's because *Computerworld's* total audience blankets key vertical markets that are major users – and major buyers – of computer products and services.
So if you're selling computer products and services, advertise in the newspaper that delivers over 612,000 potential buyers. Advertise in Computerworld's Classified Marketplace!
For more information, call
800/343-6474
(in MA, 508/879-0700)

TEKTRONIX COLOR OUTPUT SYSTEM
4692 Color Printer $3195
(was $4995)
4510A Rasterizer $3995
(was $4495)
Save $1500 when you purchase the products as a system
Reconditioned Products: Our demo and lease returns are restored to latest specifications and are available with a variety of options.
These products carry Tek's full warranty.
For purchasing or leasing information, call
1-800-TEK-6100
Tektronix
GWD-122

IBM Unit Record Equipment
Data Modules/Disk Packs
Magnetic Tape/Diskettes

029-082-083-084-085-088
129-514-519-548-557-188
2316-3336(1)&(11)-3348(70)
80-200-300 MB
Disk Packs

Thomas Computer Corp.
6836 W. Howard Chicago IL 60648
800-621-3906 312-647-0880

BUY, SELL LEASE IBM CPU's
3081's, 3083's, 3084-QXX, 3090
PILLAR SILENT BLOCK, PARALLEL CABINET
GTEX Financial Group
(214) 783-1212
CDLA Est. 1978

FOR SALE
IBM SYSTEM 38
MODEL 700
EMC MEMORY
8 Communication Lines
Extended Workstation Control
(719) 475-5295
Ask for Kathy

Computerworld's
Classified Marketplace
gives you reach to over 612,000 potential buyers!
For more information, call:
800/343-6474
or (in MA, 508/879-0700)

Used/Lease/Rent

SELLING A DATA CENTER?

Or Computer Equipment?
Call Bencom it's our Specialty

Highest Prices Paid - Fast & Professional

* Systems PC's to Mainframes - All Brands
* CRT's and Printers - All Brands
* Communications Equipment - All Brands
* Cabling, Flooring and Cooling Systems
* One or Multiple Locations
* Liquidations

February Special - Computer raised flooring starting at $6.00 per sq. foot.

BENCOM MARKETING 306 El Norte Parkway Escondido, CA 92026 (619) 480-7400

IBM BUY · SELL · LEASE

Member Computer Dealers & Lessors Association CDLA

SYSTEM 36/38 · AS/400 · 43XX 30XX · AT&T VOICE SYSTEMS · SERIES 1

• Processors
• Peripherals
• Upgrades

DEMPSEY & ASSOCIATES

18377 Beach Blvd., Suite 323
Huntington Beach, CA 92648 (714) 847-8486

(800) 888-2000

Reconditioned digital™ Equipment

Whatever your requirements are for Digital Equipment, call CSI *first!* Buying, selling, trading, leasing, consignments - we do it all!

CSI sells all equipment with a 30 day unconditional guarantee on parts and labor and is ***eligible for DEC maintenance.***

Offering systems, disk drives, tape drives, printers, terminals, memory, options, boards, upgrades and many more.

CSI Computex Systems, Inc.
75 Tosca Dr. Stoughton, MA 02072
CALL TOLL-FREE 1-800-426-5499
In Mass. (617) 344-8600
FAX (617) 344-4199

DEC PDP-11 SYSTEMS & PERIPHERALS

BUY & SELL

THE One-Stop EXCHANGE!
• CPUS • TERMINALS
• DISC DRIVES • PRINTERS
• INTERFACES, ETC.

dce DIGITAL COMPUTER EXCHANGE INC
27773 Industrial Blvd., Hayward, CA 94545
FAX (415) 887-5366 TLX 709536

Call (415) 887-3100

IBM HARDWARE BUY • SELL • LEASE

CDLA

AS/400 S/3X S/1 POS PARTS

AMCOM CORPORATION

800-328-7723
612-829-7445
5555 WEST 78TH STREET
MINNEAPOLIS, MN 55435

Promises, promises...

Every secondary market firm promises service and support, but it is a unique company that really commits to it. At Tridex, our goal is to be the first and last choice you make. The only way to do this is to honor our promises. We promise the best warranty in the business. (12 months on new and reconditioned equipment). Some of our competitors treat you like history once the sale is made. At TRIDEX, you're our future.

TRIDEX CORPORATION

Phone: 603-886-0383
Fax: 603-886-0914

375A WEST HOLLIS ST. NASHUA, NH 03061

sun microsystems · IBM · digital™

SALE OR LEASE DATA GENERAL

DG

- MV20000
  - 5.5MIPS
  - ZERO TO 64 MB
- MV15000 UPGRADES
  - MOD 10 TO 20
  - MOD 8 TO 20
  - MOD 8 TO 10

213-215-0641

CATALINA COMPUTERS, INC.
1001 W. Arbor Vitae St.
Inglewood, CA 90301
FAX 213 649-1065

HP 3000

ATP's • S/70
7937H • 7933H

Available in Quantity

Processors • Peripherals Systems

All In Stock - Immediate Delivery

All warranted to qualify for manufacturer's maintenance

BUY • SELL • TRADE
RENT • LEASE

ConAm Corporation
It's Performance That Counts!
800/643-4954 213/829-2277

DEC-IBM BUY / SELL

VAXs
MICROVAX II, III SYSTEMS
IBM S/36, S/38, 43XX, 30XX, AS400 • PERIPHERALS
IBM XT, AT, PS/2
ALL MICROS
IBM AT 339s (New & Refurb)
IBM 3174 51Rs (New & Refurb)
ALL KEY, PBX & Telecom EQPT.

LINK PROCESSOR

603 E. Town St.
Columbus, OH 43215
Phone: 614-464-1638
FAX: 614-239-8386

NEW IBM 9370

9375 Central processor 8MB
(4) 9335 disk drives (B) - 3 gigabytes
(2) 9335 disk controllers (A)
(2) 9309 racks (CPU and disk)
4245 printer - 2000 LPM
(5) 3299 terminal multi plexor
(36) 3191 CRT terminals
(2) 3420 tape drives
3803 tape controller

Under IBM Maintenance
Available Immediately

(404) 955-5525

SAVE UP TO 50% ON WANG

Get a bang For your buck. Buy WANG 'from us!

NORCOMEX LTD.
Second User Equipment
34 Futurity Gate, Unit 17
Concord, Ont. Canada L4K1S8

OVERSEAS INQUIRIES CALL COLLECT

(416) 738-0523 (416) 738-1059
TELEX 06-868391 TOR. FAX (416) 738-9013

IF YOU'RE BUYING, WE'RE SELLING

36 38 4300

IF YOU'RE SELLING, WE'RE BUYING

IBM SYSTEMS
Buy • Sell • Lease PERIPHERALS

(800) 331-8283
TOLL FREE

(213) 394-1561
CALIFORNIA

Ocean Computers, Inc.
919 Santa Monica Blvd., Ste. 200
Santa Monica, CA 90401

CDLA

Northeast Terminal & Computer Services

Box 330, Billerica MA 01821, 800-445-0005, (617)273-0670, FAX (508)667-1626

	"NEW"	REFURB
VT220	Call	350
VT320	450	375
VT330	1655	1295
VT340	2450	Call
LA120	Call	595+
LA100	995	595+
LA210	1450	1045
WY50	445	250
WY60	495	Call
WY75	595	325
WY85	625	375
Visentech	Call	

	REFURB
LA50	325
LA75	675
VT100	150
VT101	175
VT102	195
VT103	375
VT131	195
CIT101	125
CIT101E	175
CIT220+ w/o kbd	150
TVI1950	195
TVI1921	195
Visual 241	Call

	REPAIR
Zenith PC	Call
IBM PC	Call
DEC, Citoh, Wyse, Qume, Leer/Siegler,	
TVI CRT's	100
Most Printers	125
Most Keyboards	65
LA120 (PS)	95
LA120 (LB)	95
LA210 (PS)	75
LA210 (LB)	95
Hard disks	Call

Southeast Terminal Corporation
Box 8529, Hobe Sound FL 33475, 800-633-5887, (407)546-1112, FAX (407)546-1137
Depot Repairs, Upgrades, Modules, Leases, On-Site Maintenance, 24 Hour Turnaround

Associates Inc.

- Data General
- Fujitsu
- Data Products
- CDC
- Printronix
- Zetaco

BUY SELL TRADE

(617) 982-9664
FAX: (617) 871-4456

FOR SALE 2 IBM System 38s

Model 600 - 16 MG
Model 700 - 32 MG

Both CPUs fully loaded and under IBM maintenance.
No DASD included.

CONTACT: Linda Whilden or Dave Hogan
(803) 297-6101

BUILDER MART

Used/Lease/Rent

CALL US LAST

GET YOUR BEST PRICE
Then Call
SPECTRA PRODUCTS, INC.
For The Best DEAL
WE
Buy - Sell - Lease - Rent
IBM and DEC™SYSTEMS
NEW and USED
Other Services Available
Installation and Maintenance
Contract Programming

Call 800-238-6405
IN TN 901-754-6500

SPECTRA PRODUCTS, INC.
1669 KIRBY PKWY. MEMPHIS, TN 38119
"SINCE 1974"
Formerly Computer Brokers, Inc.

WANT TO BUY

3720'S • 3725'S

FOR SALE

3720's • 3725's • 3745's

DDC Communication Controller Specialists

Distinctive Dataprocessing Consultants, Inc.

Call us for a quote on your features, upgrades, and line sets!

(214) 869-2214
FAX 214-869-1589

DEC

BUY - SELL - TRADE
"We love to spend money buying DEC equipment"

CCI
Carlson Computer International
3534 E. Sunshine
Springfield, MO 65804
(417) 887-1907 (800) 548-7073
FAX 417-887-2305

MEMORY CHIPS
BUY - SELL
We sell the entire DEC line specializing in memory.

AS/400

S/38 S/36

Upgrades - Features
Displays - Printers

GENICOM PRINTERS
Twinax - Coax
Faster than IBM -
- 40% Less Cost

QUICK DELIVERY
BEST PRICE
TOLL-FREE HOTLINE
LeasPak International
1-800-532-7725

BURROUGHS UNISYS

B20 - B7000
A Series - V Series
All Peripherals

Low Lease Rates
Depot Maintenance

LDI/
COMPUTER PROVISIONS CORPORATION
(216) 687-0307

DATA GENERAL

MV/15000 MOD 8

12 Mb Memory
1.77 Gigabyte Disk
4307-T Tridensity Tape
4373-A Printer
(4) 6215 Serial Printers
(39) D214 Terminals

AMES SCIENCES, INC.
(301) 476-3200
FAX (301) 476-3396

BUY OR SELL NEW OR USED

IBM PC * XT * AT * PS/2
COMPAQ * HP * AT&T * WANG
MACINTOSH * APPLE 2

1-800-262-6399

Boston Computer Exchange Corporation
MA 617-542-4414
FAX 617-542-8849

W A N T E D

OBSOLETE AND EXCESS COMPUTER EQUIPMENT

Top Cash Paid

We purchase all types of obsolete or excess computer equipment and peripherals. We pay costs for all shipments as well as top prices.

Call today for a quote on your system.

COMPU-SCRAP, Inc.
Randolph, MA 02368
(617) 341-2695
Call Collect!

PRIME

EXPERIENCED SYSTEMS AND PERIPHERALS

BUY-SELL-LEASE-BROKERAGE

NEW PLUG-COMPATIBLE DISK, TAPE, MEMORY

PLUS
THE FASTEST I/O AVAILABLE ANYWHERE

1ST SOLUTIONS, INC
11460 N CAVE CREEK ROAD
PHOENIX, AZ 85020
602-997-0997
ASK FOR DON SHIFRIS

DATA GENERAL

BUY-SELL-TRADE

SYSTEMS, PERIPHERALS, OPTIONS, TERMINALS AND PARTS

DATA INVESTORS CORP.
6 WEST 18 STREET
NEW YORK, NY 10011
212-675-1000
FAX 212-645-4539

Your used computer equipment deserves a second chance

If you have used computer equipment to sell, *Computerworld's* product Classified Marketplace is the best place to do your selling. That's because Classified Marketplace features a Used Equipment section to help you market your equipment to the very people who are looking to buy.

And when you advertise in Classified Marketplace, you reach a total (ABC-audited) audience of over 612,000 computer professionals who turn to *Computerworld* for news, information, features - and Classified Marketplace - every week.

So give your used computer equipment a second chance today. Call 800/343-6474 (in MA, 508/879-0700) to reserve your space.

COMPUTERWORLD
CLASSIFIED MARKETPLACE
Where all computer buyers and sellers can go to market.

WE BOUGHT IBM

By the thousands.

And we still do. Computer Marketplace has bought thousands of IBM AS/400, Series 1, S/3X, 43XX, 30XX, tapes, drives, printers and other peripherals and we are very interested in offering you top dollar for yours.

We also deal in data communication equipment such as **multiplexors, modems** and **protocol converters.**

Or if you have a need to buy, call us first and **BUY DIRECT** from the...

COMPUTER™ MARKETPLACE
800-858-1144
In California, dial (714) 735-2102
205 East 5th Street, Corona, CA 91719

IBM IS A REGISTERED TRADEMARK OF INTERNATIONAL BUSINESS MACHINES, INC. CDLA

We Buy & Sell DEC

Systems
Components

Digital Computer Resale
call:713 445-0082
600 Kenrick Ste C22
Houston, Tx 77060

DEC VAX & AT&T

BUY-SELL-NEW-USED

Systems, Peripherals, Options available for sale

Looking to purchase VAX and AT&T Systems, Hardware

LAKEWOOD COMPUTER CORP.
436 Linda Lane
Ft. Collins, CO 80524
(303) 493-6406 FAX:(303) 493-6409

SUBLEASE!!!

IBM 3090-120E
32 Mb 16 Channels
32 month lease remaining

Direct negotiations with current users
May offer very competitive terms
Available within 30 days

(408) 370-4907

• Buy • Sell • Trade • Rent

IBM Displaywriters
5525 — OFFICE SYSTEMS
5219 — 5256 — 5258
6670 PRINTERS
SYSTEM 34 36

CDB FINANCIAL, INC.
3520 DILLO ROAD
DALLAS, TEXAS 75228
800 648-6791
214 324-3491 Member CDLA

612,000 MIS/DP Professionals
see the *CLASSIFIED MARKETPLACE*
each week
Call for advertising information:
(800) 343-6474
(In MA., 508-879-0700)

Time/Services

KOOTECH

Innovative Computer Techniques

COMPUTER SERVICES

IBM 3084

● Batch Processing ● Public Network Access
● Timesharing ● Laser Printing

Route 202, Raritan, N.J. 08869
201-685-3400
Contact: Joyce Bogaenko

CONVERTING?

Honeywell to IBM
Assembler to Cobol
CICS Macro to Command
DOS to MVS
Any Cobol to any Cobol

Professional staff, experienced in conversion.

Specific methodologies for:
- Conversion Project Management
- Feasibility & Planning
- Technical Conversion

NEOSYNETICS, INC.
3158 Des Plaines Avenue
Des Plaines, Illinois 60018
312/299-0900

NEW AND USED RAISED FLOORING

Immediate Delivery
Quality Installation

Raised Computer Floors
One Charles Street
Westwood, NJ 07675
(201) 666-8200
FAX (201) 666-3743

DEC - 20

We run your programs while you work on the future.

LANDART SYSTEMS, INC.
65 Broadway, NY, NY 10006
212-363-3170

MIS

SUCCESS WITHOUT STRESS

NATIONWIDE REMOTE COMPUTING SERVICES

- Fixed Price Computing
- Remote Facilities Management
- General Time-sharing Services
- Image/Forms Design and Laser Printing
- Integrated Financial Applications
- Major Third Party Software Packages
- Micro/Mainframe Applications
- Nationwide Network
- Operating System Conversions
- Overflow Processing

DATA CENTERS:
Boston, MA
Los Angeles, CA
Washington, DC

CALL 1 800 PLAN LCS
1 800 752-6527

Litton
Computer Services

COMPUTING SERVICES

MVS/XA VM/370
DOS/VSE CICS
TSO CMS
DB2 IMS/DBDC
4GL SAS

MULTIPLE CPUs - 50+ MIPS

TELENET, TYMNET

IBM INFORMATION NETWORK

DEDICATED SYSTEMS AVAILABLE

GIS
INFORMATION SYSTEMS, INC.

815 COMMERCE DRIVE
OAK BROOK, IL 60521
312-574-3636

COST-EFFECTIVE COMPUTING SERVICES for TODAY and ... TOMORROW

COMDISCO COMPUTING SERVICES CORP. provides you with low-cost, state-of-the-art computing services.

- IBM® CPUs and Peripherals
- Systems Software: MVS/XA, TSO/E, ISPF/PDF, CICS, VM/XA, VM/SP, HPO, CMS
- Application Software: Database Management, Application Development, 4/GLs, Statistical Analysis, Graphics
- Multiple Communications Methods
- Technical Support
- Pricing to fit your needs

IBM is a registered trademark of International Business Machines Corporation

For more information
Call Jeff Daum
201-896-2030

COMDISCO

COMDISCO COMPUTING SERVICES CORP.
P.O. Box 26
Carlstadt, NJ 07072

Advertise Your Products In The *CLASSIFIED MARKETPLACE*

Featuring:

- ☐ Used/Lease/Rent
- ☐ Hardware
- ☐ Software
- ☐ Peripherals/Supplies
- ☐ Communications
- ☐ Graphics/Desktop Publishing
- ☐ Time/Services
- ☐ Bids/Proposals/Real Estate
- ☐ Business Opportunities

Reach over 612,000 information systems professionals by placing your company's message in Marketplace.

Name:_____
Title:_____
Company:_____
Address:_____
City:_____
State:_____ Zip:_____

☐ I am enclosing ad material with this form

Ad size:

_____ columns wide x _____ inches deep.

Return this form and advertising material to:

Computerworld
Classified Marketplace
375 Cochituate Road, Box 9171
Framingham, MA 01701-9171

or call a representative today for the details:

(800) 343-6474
(In MA., (508) 879-0700)

ON-LINE WITH COMPUSOURCE

- Multiple centers
- MVS, VM, DOS
- RACF, CICS, IMS
- Decision support software including SAS
- Volume and term discounts
- Worldwide access
- Full technical support
- Laser printing
- Disaster recovery services

COMPUSOURCE
(919) 469-3325

COMPUTER SERVICES

MVS/XA VM/SP
ISPF/PDF CMS
IMS SAS
CICS FOCUS
DB2/QMF INQUIRE

TYMNET
LASER PRINTING
(415) 768-1617

BECHTEL
INFORMATION SERVICES

Full-Service Remote Computing With a Difference

Let us be your data center. And get high-quality computing service that can make a big difference in your bottom line. All from MCN Computer Services.

Full IBM compatability:

MVS/XA JES2	IMS/DC
VM/XA	IDMS/R
CICS/VS	DB2
ROSCOE	QMF
TSO/E	PROFS

We also have the latest programmer productivity aids: FILE-AID, DBUG-AID, CICS PLAYBACK and CICS ABEND-AID to name a few.

We provide state-of-the-art systems, software and security for major clients across the country. And we deliver high-quality, cost-effective services that include:

- Laser and high-speed custom (advanced function) printing
- Mail insertion

For more information, call:
1-800-521-0444

MCN Computer Services
5225 Rotunda Club Drive
Dearborn, MI 48128

DATA CONVERSION

- Optical Scanning
- Disk Conversions
- Tape Conversions

Impressive service at *Impressive* prices!

Call:
800-426-3776 or 502-426-9448

TROPUS, Inc.
3704 Hillsboro Rd., Louisville, KY

NEW!

IBM MVS-ESA Test and Development Center

- IBM 3090/300E - PR/SM
- IBM 3090/120E - Standalone
- Destructive Testing
- Major Databases - DB2, IMS
- Worldwide Network
- Early Release Site

Remote Computing Services 24 Hours/ 7 days a Week

- Dual 3090s - MVS/XA, VM/XA
- DEC-VAX, Wang/VS, HP3000
- Extensive Software Available
- Application Proc'ing
- Cost Effective

INET
INFORMATION NETWORK CORPORATION

For More Information And Pricing Call
1-800-222-1590, Ext 372

CLASSIFIED

Hardware

WITH 386 PRICES LIKE OURS WHY SETTLE FOR A 286.

20 MHz 386 Sys/60MB HD.....~~$2,499.95~~
24 MHz 386 Sys/60MB HD.....$2,699.95
30 MHz 386 Sys/60MB HD.....$2,999.95

All systems include:
1MB RAM, 1.2MB or 1.44MB FD, 14-Inch Mono Monitor and Graphics Card, Serial, Parallel, and Game Ports, 101-Key KB and....

1-Year Warranty.

CALL 508-820-0335
OR WRITE

NCC
46 Singletary Lane
Framingham, MA 01701

PREPAYS AND CODS ONLY.

BUY SELL LEASE

DEC/VAX

CALL
LDI/
COMPUTER
PROVISIONS

Lou Vascek

(216) 687-0307

Computerworld's

Classified Marketplace

delivers your message to companies that plan to buy your product or service.

From PCs to minis, mainframes to supercomputers, Computerworld's readers buy products across all ranges of today's computers. So if you're selling, advertise in the newspaper that delivers readers that plan to buy **YOUR** product or service. Advertise in Computerworld's Classified Marketplace!

For more information, call

800/343-6474

(in MA, 508/879-0700).

Graphics/Desktop Publishing

COMPUTER DATA DISPLAYS
PC Screen to Large Screen

Look to BOXLIGHT—The LCD Specialist—For the Right System to Meet Your Needs.

KODAK DATASHOW

+Eiki, Apollo, Chisholm and others.
Prices start at

$599

Solutions for VGA, EGA, CGA, all MACs & more
M/C, VISA, AMEX & COD

BOXLIGHT CORPORATION
(415) 892-4744
Computer-Based Presentation Systems Since 1984

Your Used computer equipment deserves a second chance.

If you have used computer equipment to sell, *Computerworld's* Classified Marketplace is the best place to do your selling. That's because the Classified Marketplace features a Used/Lease/Rent section to help you market your equipment to the very people who are looking to buy.

And when you advertise in *Computerworld* Classified Marketplace, you reach a total (ABC-audited) audience of over 612,000 computer professionals who turn to *Computerworld* for news, information, features - and the Classified Marketplace - every week.

So give your used computer equipment a second chance today. Call **800/343-6474** (in MA, 508/879-0700) to reserve your space.

Software

FREE BUYER'S GUIDE

When you need programmer's development tools, Programmer's Connection is your best one-stop source. We are an independent dealer representing more than 300 manufacturers with over 800 software products for IBM personal computers and compatibles including: COBOL compilers and utilities, relational databases, and much more. Call today to receive a **FREE** comprehensive Buyer's Guide, and find out why Programmer's Connection is your best connection for software tools.

Programmer's Connection
7249 Whipple Ave NW
North Canton, Ohio 44720

US.....**800-336-1166**
Canada.....800-225-1166
International.....216-494-3781
FAX.....216-494-5260
Telex.....9102406879

ROOMER2

Create computer room layouts and 3D views with your IBM PC or compatible. New library of computer components makes it quick and easy. From $295. Call for free brochure. Money Back Guarantee

Hufnagel Software • PO Box 747
Clarion, PA 16214 • (814) 226-5600

MVS

PRODUCTS/IDEAS

Major software developer/marketer is interested in acquiring or representing high quality MVS, MVS/XA, CICS, TSO, VSAM, DASD performance/productivity optimizing software utilities, products or new ideas. We invite responses in absolute confidence to Box 35570 Monte Sereno, CA 95030

Computerworld's Classified Marketplace
gives you reach to over 612,000 potential buyers!
For more information, call:
800/343-6474
or (in MA, 508/879-0700)

Bids/Proposals/Real Estate

MISSISSIPPI CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by the CDPA, 301 N. Lamar St., 301 Building, Suite 508, Jackson, MS 39201 for the following equipment and services:

General Request for Proposal No. 1520, due Thursday, March 30, 1989 at 3:30 p.m. This is a special general RFP to be used through January 1990 for the acquisition of word processing systems for MISSISSIPPI GOVERNING AUTHORITIES.

Request for Proposal No. 1521, due Thursday, March 30, 1989 at 3:30 p.m. for the acquisition of peripherals for an IBM Wheelwriter 5 typewriter for the MISSISSIPPI DEPARTMENT OF NATURAL RESOURCES.

Request for Proposal No. 1522, due Monday, April 3, 1989 at 3:30 p.m. for the acquisition of the hardware and software required to establish a local area network among existing personal computers and the acquisition of the services required to install the network, train the users and migrate and install software on the newly created network for the Mississippi Guarantee Student Loan Agency, a division of the STATE INSTITUTIONS OF HIGHER LEARNING.

Request for Proposal No. 1523, due Thursday, April 6, 1989 at 3:30 p.m. for the acquisition of a microcomputer-based computer managed basic skills instructional program for MISSISSIPPI DELTA JUNIOR COLLEGE.

Request for Proposal No. 1524, due Tuesday, April 18, 1989 at 3:30 p.m. for the acquisition of a distributed processor, related peripherals, and software for the Forest Product Laboratory at MISSISSIPPI STATE UNIVERSITY.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

Patsy Stanley @ (601) 359-2604

THE CITY OF NEW YORK DEPARTMENT OF ENVIRONMENTAL PROTECTION REQUEST FOR PROPOSAL

The Environmental Control Board has issued a Request for Proposals (RFP) for the purchase and installation of a computerized collection system.

A copy of the RFP package may be obtained in person from the Department of Environmental Protection (DEP) at the Environmental Control Board, 1250 Broadway (at 32nd Street) 7th floor, New York, New York 10001, as of March 24, 1989. A pre-proposers conference is scheduled for April 7, 1989 at 10:00 AM at the above address.

All proposals must be submitted no later than April 21, 1989 to be considered by DEP.

Computerworld's

Classified Marketplace

delivers your message to companies that plan to buy your product or service.

From PCs to minis, mainframes to supercomputers, Computerworld's readers buy products across all ranges of today's computers. So if you're selling, advertise in the newspaper that delivers readers that plan to buy **YOUR** product or service. Advertise in Computerworld's Classified Marketplace!

For more information, call

800/343-6474

(in MA, 508/879-0700).

Peripherals/Supplies

GENUINE HEWLETT PACKARD TONERS

$79.50

Series II 92295A or Original 92295A

Huge Inventory In Stock
For Same Day Shipment Call
•1-800-22-TONER
•1-800-228-6637
Plotter Supplies At Similar Savings

TONERS PLUS...

DISKETTE SALE

High-Tech software company has a large surplus of used diskettes (360k & 1.2 mb). We will be selling diskettes in minimum orders of 10,000. For more information call or write:

Autodesk, Inc.
2320 Marinship Way
Sausalito, CA 94965
Attn: Andre' Davis
415-332-2344 xt. 4510

It's the CLASSIFIED MARKETPLACE

Reach Computer Professionals Where They Shop For:

- ☐ *Used/Lease/Rent*
- ☐ *Hardware*
- ☐ *Software*
- ☐ *Peripherals/ Supplies*
- ☐ *Communications*
- ☐ *Graphics/Desktop Publishing*
- ☐ *Time/Services*
- ☐ *Bids/Proposals/ Real Estate*
- ☐ *Business Opportunities*

CALL NOW

(800) 343-6474

(In MA., (508) 879-0700)

COMPUTERWORLD CLASSIFIED MARKETPLACE
Where all computer buyers and sellers can go to market.

Computerworld's

Classified Marketplace
gives you reach to over 612,000 potential buyers!

And this audience is even verified by the Audit Bureau of Circulations in the only independently audited pass-along survey of its kind. What's more *Computerworld's* Classified Marketplace penetrates buying companies in all major industries. That's because *Computerworld's* total audience blankets key vertical markets that are major users -- and major buyers -- of computer products and services.

So if you're selling computer products and services, advertise in the newspaper that delivers over 612,000 potential buyers. Advertise in Computerworld's Classified Marketplace!

For more information, call

800/343-6474

(in MA, 508/879-0700)

COMPUTERWORLD
CLASSIFIED MARKETPLACE
Where all computer buyers and sellers can go to market.

Business Opportunities

OVERSEAS SOFTWARE COMPANY SEEKS DEVELOPMENT CONTRACTS

Managed by former executive of large U.S. computer vendor. U.S. based maintenance & support. Attractive cost & high quality. Terms negotiable. Enquiries solicited:

PO Box 4370
Denver, CO 80204

The CLASSIFIED MARKETPLACE

Reach Over 612,000 Computer Professionals When They Reach For

COMPUTERWORLD!

(800) 343-6474

(in MA. (508) 879-0700)

It's the *CLASSIFIED MARKETPLACE*

Reach Computer Professionals Where They Shop

- ☐ Used/Lease/Rent
- ☐ Hardware
- ☐ Software
- ☐ Peripherals/Supplies
- ☐ Communications
- ☐ Graphics/Desktop Publishing
- ☐ Time/Services
- ☐ Bids/Proposals/Real Estate
- ☐ Business Opportunity

CALL NOW

800-343-6474

(In MA., 508/879-0700).

Clueing in company leadership

Educating user management is linchpin in effective computer strategies

BY NAOMI KARTEN
SPECIAL TO CW

In many organizations, managers are unaware of the responsibilities associated with computing. Ignoring these responsibilities, however, can spell the difference between success and disaster. Fulfilling them can determine whether computing can be used with confidence in making business decisions.

While hands-on users concentrate on the mechanics of hardware and software, managers need education about the risks they face and the responsibilities they assume when their staff members become computer users.

Such an educational program can touch on a range of topics. These include security, legal obligations, effective support services, selection of computer-proficient staff members, hardware and software acquisition, network administration and data access policies. The level of detail may vary depending on the nature of the business and computing environment.

The following are topics appropriate to a management education program.

The hidden costs of computing. For the uninitiated, computing seems to be filled with surprise costs. This situation makes it difficult for management to budget appropriately. A discussion of start-up and ongoing costs for equipment, software, installation, maintenance, staffing and training can help reduce the surprise element and help managers prepare more realistic budgets.

Two of the most frightening costs of end-user computing are difficult to translate into dollars and cents. The first cost relates to computer misuse, such as the accidental deletion of a file. The second involves the cost of a bad decision generated by an application error or a misunderstanding of how a package works. In general, management must be encouraged to guard against wasted time while continuing to support adequate training and practice.

Use and misuse of data. Examples drawn from relevant business applications can be used to demonstrate to management how easily users can generate erroneous results through the inadvertent misuse of data.

Data snafus can occur in several ways. One of the easiest is misinterpretation of what an element represents, such as the assumption that a sales figure represents a monthly total rather than an annual total.

Another data error route comes from comparing fields that should be comparable but are not because of a slight difference in definition. For example, Department A maintains project estimates in man-weeks and Department B maintains them in man-hours.

A third and particularly common source of errors involves the application itself, such as when a decimal point is misplaced or a calculation miskeyed. The business implications of such errors can be easily highlighted through the use of familiar examples.

Standards and controls. How-to's and how-not-to's are rampant in computing, and users often feel impeded by the number of guidelines and their apparent senselessness. Managers are more likely to support standards if they understand the reasoning behind the rules: why product standards have been established; why it is important to document applications; why data should be backed up, and equipment and data secured; and why various company guidelines exist and the potential impact of ignoring them.

It is also valuable to review the importance of having a consistent approach to computing from one day, staff member and application to the next.

Management needs to appreciate the importance of delegating responsibilities. Such delegation means designated department members are accountable for various functions such as performing backups, updating databases and providing software version control. With an awareness of these responsibilities, managers will be in a better position to oversee computing in their areas.

Staffing considerations. Computing is changing the way people do and view their jobs. Thus, management needs guidance in thinking about a range of questions: What computer skills should department members master? What skills are nice, but not necessary? What is the optimum way to acquire these skills? What attributes should management look for in recruiting employees who will be given computer responsibilities? How can a department adequately plan for people backup as well as data backup?

Increasingly, departments will need a mix of business and computer skills. This type of forum is excellent for introducing and discussing some of these questions.

In addition, computers are changing the way businesses perform tasks. The flow of information within and between departments is gradually changing as computer technology makes it possible for more tasks to be performed locally rather than by a central MIS group.

A management education program that addresses the organizational impact of computers can help management view the devices not just as word processing or spreadsheet machines but as keys to the way work will be performed in the future.

Ultimately, the only way end-user computing can succeed is through managers' taking responsibility for the computing in their areas. Management education can be an important step in this direction.

A MANAGEMENT education program that addresses the organizational impact of computers can help management view the devices not just as word processing or spreadsheet machines but as keys to the way work will be performed in the future.

Karten is president of Karten Associates in Randolph, Mass., and editor of the monthly newsletter "Managing End-User Computing."

Educate your customers through Computerworld's TRAINING Section.
For More Information Call:
(800) 343-6474
In MA, (508) 879-0700)

REQUEST FOR PROPOSALS
(RFP) FOR THE STATE OF WISCONSIN COMPUTER TRAINING SERVICES
The Department of Employment Relations, Office of Employee Development and Training, 137 E. Wilson Street, P.O. Box 7855, Madison, Wisconsin 53707-7855.
Proposals are being solicited to secure training services for IBM, IBM-compatible, UNIX and Unisys computer-related classes. This RFP will be released on or about March 13, 1989. A proposer's conference will be held at the Memorial Union, 800 Langdon Street, Madison, WI on March 30, 1989 at 9:30 A.M. CST. The letter of Intent to Propose is due April 15, 1989. Proposals are due on or before 4:00 P.M. DST May 3, 1989.
Copies of this RFP or information regarding this request may be obtained from J. Cullen at the above address or phone (608) 266-9673.

SUPERB VIDEO COURSES AT MAIL-ORDER PRICES
A Treasury of Top-Notch Training for Microcomputer, Mainframe and MIS Shops
Intro to PS/2, Lotus 1-2-3, dBASE, WordPerfect, Enable, PASCAL, Assembler, MVS JES2, CICS/VS, TSO/ISPF, OS/VSAM, DOS/VSE JCL, IMS, VM/CMS, Structured COBOL, Project Management, Distributed Systems, Data Communications, Structured Systems Analysis & Design, Computer Literacy
Over 50 courses to increase productivity and reduce costs. Simple, flexible, and reliable VHS video with workbooks. Interactive Videodisc, U-Matic and BETA formats available.
FOR A FREE CATALOG CONTACT: (212) 652-7171
EDUTRONICS
Learning Systems
80 Wall Street,
New York, NY 10005
Additional 15% Discount on your First Course

Still creating CBT the old fashioned way...Slowly?

Find out why couseware authors are switching to the PROPI Authoring System. Flowchart course strategy. Use interactive editors for screen design, video support, and record keeping.
Write ASYS, 104 Viewcrest, Bellingham, WA 98225 or call (206) 734-2553

Your Employees Can Learn Software in Half the Time!

ATI on-disk tutorials cut learning time in half. It's a fact — proven by university studies, Fortune 500 firms, and well over 1,000,000 end users. And with prices starting under $50, it's the most cost-efficient way to get your staff up to speed on popular PC software programs. Discover the best kept secret in computer training. Call today for details:
1-800-421-4827 (Dept.102)
or 1-213-823-1129 (in California)
Dealer inquiries welcome.
ATI American Training International

Computerworld Training Editorial Schedule

March 20th - Educating management about using computers
March 27th - Self-directed learning
April 3rd - DP Training Organizations & the Public School Market
April 10th - Developing an Automated Training Management System
April 17th - Evaluating Training Vendors
April 24th - Preparing the RFP for Training Services

Educate your customers through Computerworld's TRAINING Section.
For More Information Call:
(800) 343-6474
(In MA, (508) 879-0700)

Educate your customers through Computerworld's TRAINING Section.
For More Information Call:
(800) 343-6474
(In MA, (508) 879-0700)

SALES OFFICES

Publisher/Fritz Landmann

Senior Vice President/Associate Publisher/Val Landi, **COMPUTERWORLD**, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, (508) 879-0700

BOSTON: Northern Regional Director/David Peterson, **Sr. District Managers**/Gil Cadigan, Sherry Driscoll, **District Manager**/John Wallis, **Sales Assistants**/Alice Longley, Lisa Bonaccorso, Paula Wright, **COMPUTERWORLD**, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700

CHICAGO: Eastern Regional Director/Bernie Hockswender, **Midwest Regional Manager**/Kevin McPherson, **District Manager**/Larry Craven, **Sales Assistants**/Kathy Sullivant, Karol Lange, **COMPUTERWORLD**, 10400 West Higgins Road, Suite 300, Rosemont, IL 60018, (312) 827-4433

NEW YORK: Eastern Regional Director/Bernie Hockswender, **District Managers**/Fred Lo Sapio, **Sales Assistant**/Linda Pipines, **COMPUTERWORLD**, Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652 (201) 967-1350

LOS ANGELES: Western U.S Director/Jan Harper, **Southwestern Regional Manager**/Carolyn Knox. **Sales Assistant**/Bev Raus, **COMPUTERWORLD**, 18008 Sky Park Circle, Suite 145, Irvine, CA 92714 (714) 261-1230

SAN FRANCISCO: Western U.S Director/Jan Harper, **Senior District Manager**/Ernie Chamberlain, **District Managers**/Michele O'Connor, Alicia Sanbalis, **Sales Assistants**/Chris Kobayashi, Nurit Zekman, Cynthia Yarber **COMPUTERWORLD**, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555

ATLANTA: Eastern Regional Director/Bernie Hockswender, **Southeastern Regional Manager**/Kevin C. Harold, **Account Manager**/Melissa Christie Neighbors, **Sales Assistant**/Debra Brown, **COMPUTERWORLD**, 1400 Lake Hearn Drive, Suite 330, Atlanta, GA 30319 (404) 394-0758

DALLAS: Eastern Regional Director/Bernie Hockswender, **Southeastern District Manager**/Darren Ford, **Sales Assistant**/Brenda Shipman, **COMPUTERWORLD**, 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (214) 233-0882

WASHINGTON, D.C.: Eastern Regional Director/Bernie Hockswender, **District Manager**/Paula Smith, **COMPUTERWORLD**, Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652 (201) 967-1350

Classified Advertising Director/John Corrigan, 375 Cochituate Rd., Framingham, MA (508) 879-0700

Midwest Account Manager/Marie Keyes, 375 Cochituate Rd., Box 9171, Framingham, MA 01701-9171, (508) 879-0700

New England Account Manager/Paul Bonarrigo, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700

Western Account Manager/Karen Massimino, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700

RECRUITMENT ADVERTISING SALES OFFICES:

New England Recruitment Manager/Nancy Percival, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700

Mid-Atlantic Recruitment Manager/Warren Kolber, Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652 (201) 967-1350

Midwest Recruitment Manager/Patricia Powers, O'Hare Corporate Tower One, 10400 West Higgins Road, Suite 300, Rosemont, IL 60018 (312) 827-4433

Western Recruitment Manager/Barbara Murphy, 18008 Skypark Circle, Suite 145, Irvine, CA 92714 (714) 250-0164

South-Atlantic Recruitment Manager/Kathryn Kress, 8304 Professional Hill Dr., Fairfax, VA 22031 (703) 573-4115

Recruitment Account Executives: New England/Andrew Rowe, **Mid-Atlantic**/Jay Novack, **South-Atlantic**/Pauline Smith, **Midwest**/Ellen Casey, **Western**/Chris Glenn, 1-800-343-6474 or (508) 879-0700

IDG INTERNATIONAL MARKETING SERVICES:

Managing Director/Frank Cutitta, **COMPUTERWORLD**, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700

West Coast Marketing Manager/Leslie Barner, 3350 West Bayshore Road, Suite 201, Palo Alto, CA 94303 (415) 424-1001

CW PUBLISHING/INC.

An IDG Communications Company

Fritz Landmann/**President**

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171
Phone: 508-879-0700, Telex: 95-1153, FAX: 508-872-8564

Senior Vice President/Associate Publisher, Val Landi

OPERATIONS Vice President/Operations, Matthew Smith. **Business Manager,** Mark Sullivan.
SALES Advertising Director, Carolyn Novack. **Classified Advertising Director,** John Corrigan.
Display Advertising Production Manager, Maureen Carter. **Classified Operations Manager,** Cynthia Delany.

MARKETING Vice President/Business Development, Kevin Horgan. **Manager,Marketing Communications,** Mary Doyle.
Account Manager, Marketing Communications, Elizabeth Phillips. **Manager, Trade Show & Conventions,** Audrey Shohan.

CIRCULATION Director of Circulation Management, Maureen Burke. **Director of Circulation Promotion,** Carol Spach.

PRODUCTION Production Director, Leigh Hometh. **Assistant Production Director,** Carol Polack.
Production Manager, Beverly Wolff. **Art Director,** Tom Monahan.

PUBLISHER'S OFFICE Assistant to the President, Karen Elliott. **Assistant to the Senior Vice President,** Libby Levinson.

FOREIGN EDITORIAL/SALLS OFFICES

Argentina: Ruben Argento, CW Communicaciones S/A, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: (011) 54 134-5583. Telex: (390) 22644 (BAZAN AR).

Asia: S.W. Chan, Asian Computerworld Communications Ltd., 701-4 Kam Chung Bldg., 54 Jaffe Road, Wanchai, Hong Kong. Phone: (011) 852 5 861 3238. Telex: (780) 72827 (COMWOR HX). FAX: (011) 852 5 86 10953.

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (011) 61 2 4396133. Telex: (790) AA74752 (COMWOR). FAX: (011) 61 2 439 5512.

Austria: Manfred Weiss, CW Publikationen Verlags Ges.m.b.H., Ziegelgasse 6, A-1070 Wien, Austria. Phone: (011) 43-93-15-31-0 or (011) 43-93-05-08-0. Telex: 115542 SCH/A. FAX: (011) 43-93-05-08-33.

Brazil: Ney Kruel, Computerworld do Brazil Ltda, Praca Floriano, 19/25 Andar, CEP:20031 Rio de Janeiro. Phone: (011) 55 21 240 8225. Telex: (391) 21 30830 BR.

Denmark: Preben Engell, Computerworld Danmark A/S, Torvegade 52, 1400 Copenhagen K, Denmark. Phone: (011) 45 1955 695. Telex: (855) 31566. FAX: (011) 45 154 56 14.

France: Francois Chaussonniere, Computerworld Communications S.A., 185 Avenue Charles De Gaulle, 92200 Neuilly Sur Seine, France. Phone: (011) 33 14 747 1272. Telex: (842) 613234 F. FAX: (011) 33 14 241552.

Hungary: David Fuliko, Computerworld Informatika Co., Kft. Pf. 286, 1536 Budapest, Hungary. Phone: (011) 36 1 228 458. Telex: (861) 22 6307 (KSH H).

Italy: Umberto Costamagna, Computer Publishing Group S.R.L., Via Vida 7, 20127 Milano, Italy. Phone: (011) 39-2-2613432. Telex: (843) 335318. FAX: (011) 39 2 282 0886.

Japan: Dick Yamashina, Computerworld Japan, Kasuika Omotemachi Bldg., Minato-Ku, Tokyo 107. Phone: (011) 81 3 551 3882. Telex: (781) 252-4217. FAX: (011) 81 3 582 7239.

M. Nakamura, IDG Communications Japan, c/o Maroom International, Inc., Aoaska Center Building, 1-3-12 Motoakasaka, Minato-ku, Tokyo 107, Japan. Phone: (011) 81 3 403-8515. Telex: (781) J27941 (reps for all CW Publishing publications except Computerworld Japan).

Mexico: Henry Morales, Computerworld Mexico S.A. de C.V., Oaxaca 21-2, Mexico City 7 D.F. Colonia Roma. 06700 Mexico. Phone: (905) 514 4218 or 6305. Telex: (383) 177 1300 (ACHAME).

The Netherlands: Wout Berends, IDG Communications B.V., Paulus Potterstraat 18, 1071 DA Amsterdam, The Netherlands. Phone: (0) 20-664 64 26. Telex: (844) 18243 (CWCOM NL). Fax: (20) 79 60 06.

New Zealand: Martin Taylor, Computerworld Communications Ltd., 2nd Floor, 15 Augustus Terrace, Parnell, Auckland, New Zealand. Phone: (011) 64-9-779-902. Fax: (011) 64 9 774 604.

Norway: Morten Hansen, CW Norge A/S, Hovinveien 43, 0676, Oslo 5, Norway. Phone: (011) 472 647725. Telex: (856) 76478 (CW NOR N). FAX: (011) 47 268 0152.

People's Republic of China: Chen Mingkun, China Computerworld, 74 Lu Gu Road, Box 750, Beijing 100039, People's Republic of China. Phone: (011) 47 814 0044. Telex: (716) 222214 (CCW CN).

Spain: Paco Zabala, CW Communications, S.A., Rafael Calvo, 18, 4B, 28010 Madrid, Spain. Phone: (011) 34 1 419 4014. Telex: (831) 45522 (CW E). FAX: (011) 341 419 61 04.

Sweden: Bengt Mannfeldt, CW Communications AB, Sodra Hamnvagen 22, S-115 41 Stockholm, Sweden. Phone: (011) 46 8 67 91 80. Telex: (854) 14904 9 (NOVACW). FAX: (011) 46 8 65 3132.

Switzerland: Gebhard Dietschweiler, CW Publikationen AG, Witikonerstrasse no. 15, Postfach 253, CH - 8030 Zurich, Switzerland. Phone: (011) 41 1 55 10 77. Telex: (845) 816 710 (CWCI CH). FAX: (011) 41 1 55 1135.

Taiwan: Leona Wang, ACE Media Agency Co. Ltd., P.O. Box 26-578, Room 503-1, Fu Hsin, S. Road Sec 1, Taipei, Taiwan, R.O.C. Phone: (011) 886 2 721 4302. Telex: (785) 14142 (ACE GROUP). (Representative for all CWCI publications). FAX: (011) 886 2 731 0420.

London: Martin Durham, CW Communications Ltd., 95 Gays Inn Rd., London, WC1 8UT, United Kingdom. Phone: (011) 44 1 831 9252. Telex: (851) 262346 (THEPUB G). FAX: (011) 44 1 405 2347.

United Kingdom: Euan Rose, Beare Hobson & Associates, 34 Warwick Road, Kenilworth, Warwickshire, CV8 1HE, United Kingdom. Phone: (011) 44 926 512424. Telex: (851) 311951 (BEEHOB). (Representative for all CWCI publications). FAX: (011) 44 926 512948.

Venezuela: Kalman von Vajna Nagy, CW Comunicaciones, C.R.L. Tore Maracaibo, Piso 13, Oficina H, Av. Libertador, Caracas, Venezuela. Phone: (011) 58 2 72 76 30. FAX: (011) 58 2 724970.

West Germany: Eckhard Utpadel, CW Publikationen Verlagsgesellschaft mbH, Rheinstrasse 26/28, Postfach 40 0426, 8000 Munich 40, West Germany. Phone: (011) 49 89 360860. Telex: (841) 5215350. (COMW D). FAX: (011) 49 89 3 60 86109.

IDG COMMUNICATIONS/INC.

Patrick J. McGovern
Board Chairman

Axel Leblois
Chief Executive Officer

William P. Murphy
Vice President/Finance

Computerworld is a publication of IDG Communications, the world's largest publisher of computer-related information. IDG Communications publishes over 90 computer publications in 33 countries. Fourteen million people read one or more IDG Communications publications each month. IDG Communications publications contribute to the IDG News Service offering the latest on domestic and international computer news. IDG Communications publications include: ARGENTINA'S Computerworld Argentina; ASIA'S Communications World, Computerworld Hong Kong, Computerworld Southeast Asia, PC Review; AUSTRALIA'S Computerworld Australia, Communications World, Australian PC World, Australian Macworld; AUSTRIA'S Computerwelt Oesterreich; BRAZIL'S Datalinks, PC Mundo, Micro Mundo; CANADA'S Computer Data; CHILE'S Informatica, Computacion Personal; DENMARK'S Computerworld Denmark, PC World Denmark, CAD/CAM World; FINLAND'S Mikro, Tietoviikko; FRANCE'S Le Monde Informatique, Distributique, InfoPC, Telecoms International; GREECE'S Computer Age; HUNGARY'S Computerworld SZT, PC Mikrovilag; INDIA'S Dataquest, PC World India; ISRAEL'S People & Computers Monthly, People & Computers Weekly, SBM Monthly; ITALY'S Computerworld Italia; JAPAN'S Computerworld Japan, Semicon News; MEXICO'S Computerworld Mexico, PC Journal; THE NETHERLANDS' Computerworld Netherlands, PC World Benelux; NEW ZEALAND'S Computerworld New Zealand, Computerworld Norge, PC World Norge; PEOPLE'S REPUBLIC OF CHINA'S China Computerworld, China Computerworld Monthly; SAUDI ARABIA'S Arabian Computer News; SOUTH KOREA'S Computerworld Korea, PC World Korea; SPAIN'S Climworld, Computerworld Espana, Commodore World, PC World Espana, Comunicaciones World; SWEDEN'S Computer Sweden, MikroDatorn, Svenska PC World; SWITZERLAND'S Computerworld Schweiz; UNITED KINGDOM'S Computer News, ICL Today, Lotus, PC Business World; UNITED STATES' Amiga World, CD-ROM Review, CIO, Computer Currents, Computerworld, Digital News, Federal Computer Week, GO Micro, Focus Publications, InCider, InfoWorld, Macintosh Today, Macworld, Computer + Software News (Micro Marketworld/Lebhar-Friedman), Network World, PC Letter, PC World, Portable Computer Review, Publish!, PC Resource, Run; VENEZUELA'S Computerworld Venezuela; WEST GERMANY'S Computerwoche, Information Management, PC Welt, PCWoche, Run/Run Specials.

ADVERTISERS INDEX

Andrew Network Products 86
Attachmate Corp. C3
AT&T 26-27,58-59,80-81

Bull Worldwide Information Systems 62-63
Business Software Technology ... 84

Chinon America 47
Cincom Systems 87
Codex 54,55,56,57
Command Technology Corp. 44
Computer Associates 3,23
CW Circulation 94
CW Comdex 60
CW Conference 98
CW Testimonial 100,118

Data Design Associates C4
Data General Corp. 46
Data/ware Development 42
Dell Computer Corp. 70-71
Digital Equipment Corp. 14-15
Duquesne Systems 79

EMC Corp. 50
Epson America 31,32-33
Excelan 66-67

Fischer International 25

Goal Systems 30

IBM 76-77
Infomart 78
Information Industries 28
Informix Software Inc. 75
Innovation Data Processing 7
Integral Systems 99
Intergraph 48-49
Integrated Systems Technology,Inc. 56
IPL Systems 82

JAtec Designer Systems 16

Leasametric 97

McDonnell Douglas 52-53
Micro Focus 37
Morino Associates 86

Oracle Corp. 9,11,13

Pilot Executive Software 22
Prime Computer 34-35
Progress Software 74

Racal-Milgo 88-89
Radio Shack 83
Realia 68
Relational Architects,Inc. 10
Relational Technology,Inc. 24

SAS Institute 38
SDI 72
Sequoia 64
Siemens 65
Software Spectrum 36
Sun Microsystems 17,18-19
Syncsort 5

Technology Transfer Institute 51
3 Com Corp. 43,45
Travtech 72
Trax Softworks 12

Unisys 92-93
US West 90-91

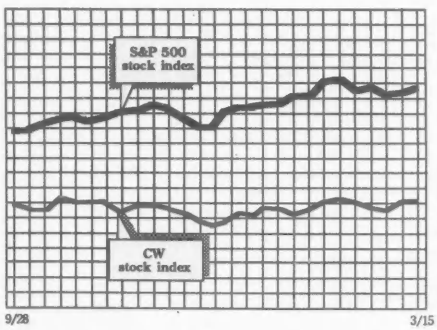
Wang 40-41
White Crane Systems 73

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Look for These Upcoming Special Editorial Features in Computerworld

Issue Date	Executive Reports	Product Spotlights
Mar. 27		CASE Products
Apr. 3	Cost Control & Justification	
Apr. 10	Innovative	PC's & Connections
Apr. 17	Business Executives Assess MIS	
Apr. 24	Managing after a Merger	
May 8	Automating the Data Center	
May 15		Manufacturing Technology
May 22	Restructuring MIS — Distributing Resources	

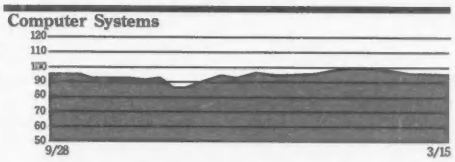
STOCK TRADING INDEX



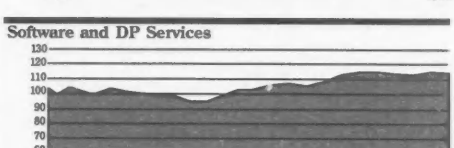
Indexes	Last Week	This Week
Communications	105.6	106.7
Computer Systems	95.8	94.6
Software & DP Services	114.0	113.9
Semiconductors	54.6	54.1
Peripherals & Subsystems	79.7	79.0
Leasing Companies	100.6	104.0
Composite Index	85.2	85.4
S&P 500 Index	123.9	124.4

Communications

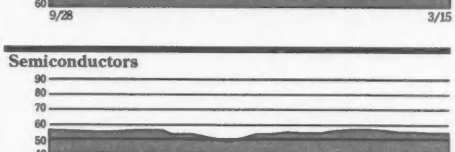
Computer Systems



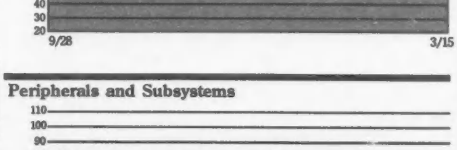
Software and DP Services



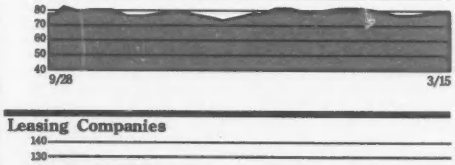
Semiconductors



Peripherals and Subsystems



Leasing Companies



Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, MARCH 15, 1989

EXCH		52-WEEK RANGE (1)		PRICE CLOSE MARCH 15, 1989	WEEK NET CHNGE	WEEK PCT CHNGE

Communications and Network Services

N	AMERICAN INFO TECHS CORP	53	42	51.25	0.1	0.2
Q	ANDREW CORP	22	13	20.25	0.3	1.3
Q	ARTEL COMM CORP	4	1	2.938	0.3	9.3
N	AT&T	33	25	32.625	2.1	7.0
Q	AVANT GARDE COMP INC	3	0	0.5	-0.1	-11.2
Q	AVANTEK INC	8	4	5.5	0.5	10.0
N	AVNET CORP	17	13	15.625	0.0	0.0
N	BELL ATLANTIC CORP	76	64	74.5	0.3	0.3
N	BELLSOUTH CORP	44	37	41.875	0.1	0.3
Q	COMPRESSION LABS INC	5	3	4.5	-0.3	-5.3
Q	COMPUTER NETWORK TECH	2	1	1.594	0.1	4.0
Q	CONTEL CORP	51	31	50	0.3	0.5
Q	DATA SWITCH CORP	10	5	5.5	0.3	4.8
Q	DIGITAL COMM ASSOC	38	17	22.875	0.5	2.2
Q	DYNATECH CORP	24	17	18.5	0.0	0.0
Q	FIBRONICS INTERNATIONAL INC	5	3	4.875	-0.1	-2.5
Q	GANDALF TECHNOLOGIES	8	5	4.875	0.3	5.4
Q	GENERAL DATACOMM INDS	6	3	5.625	0.1	2.3
N	GTE CORP	47	34	47.25	1.1	2.4
Q	INFOTRON SYS CORP	14	9	10	-0.5	-4.8
N	ITT CORP	56	44	53.5	0.8	1.4
N	M A COM INC	11	8	8	0.1	1.6
Q	MCI COMMUNICATIONS CORP	27	11	26.75	0.3	0.9
Q	NETWORK EQUIPMENT TECH INC	22	14	22.125	0.6	2.9
Q	NETWORK SYS CORP	12	8	9.125	0.1	1.4
N	NORTHERN TELECOM LTD	20	15	15.25	-0.3	-1.6
Q	NOVELL INC	38	19	32.75	-1.0	-3.0
N	NYNEX CORP	71	61	70.375	0.1	0.2
N	PACIFIC TELESIS GROUP	36	27	35.125	0.1	0.4
A	PENRIL CORP	5	4	4.5	0.0	0.0
N	PLESSEY PLC	46	25	44.75	0.3	0.7
N	SCIENTIFIC ATLANTA INC	16	10	14.75	0.6	4.4
N	SOUTHWESTERN BELL CORP	46	34	45.25	-0.1	-0.3
N	SPRINT CORP	28	16	26.75	-0.6	-2.4
N	U S WEST INC	63	50	62.375	0.4	0.6

Computer Systems

Q	ALLIANT COMPUTER SYS	8	3	3.375	-0.3	-8.9
Q	ALPHA MICROSYSTEMS	8	4	7	0.0	0.0
Q	ALTOS COMPUTER SYS	13	7	7.25	-0.4	-4.9
A	AMDAHL CORP	28	16	17.5	-0.3	-1.4
Q	APOLLO COMPUTER INC	17	7	8.25	0.5	6.5
Q	APPLE COMPUTER INC	48	34	35	-0.3	-0.7
N	BOLT BERANEK & NEWMAN	19	9	9.5	-0.5	-5.0
Q	BRITTON LEE INC	4	2	2.625	-0.3	-10.7
N	COMPAQ COMPUTER CORP	76	47	71	3.9	5.8
Q	COMPUTER AUTOMATION INC	14	3	5	0.0	0.0
Q	CONCURRENT COMP CORP	6	4	5	0.6	14.3
N	CONTROL DATA CORP	29	16	21.75	-0.3	-1.1
Q	CONVEX COMPUTER CORP	11	7	10.625	-0.4	-3.4
N	CRAY RESH INC	89	53	60.125	2.4	4.1
Q	DASY SYS CORP	12	5	4.875	-0.1	-2.5
N	DATA GEN CORP	25	17	17.25	-0.3	-1.4
N	DATAPOINT CORP	6	4	3.75	0.0	0.0
Q	DELL COMPUTER CORP	13	7	7.125	0.3	3.6
N	DIGITAL EQUIP CORP	122	88	112.125	-1.1	-1.0
N	FLOATING POINT SYS INC	5	2	2.75	-0.1	-4.3
N	HARRIS CORP	33	25	27.875	0.5	1.8
N	HEWLETT PACKARD CO	66	44	54.25	-1.3	-2.3
N	HONEYWELL INC	77	57	63.375	-0.4	-0.6
N	IBM	131	104	117	-2.6	-2.2
Q	INFORMATION INTL INC	16	12	15	-0.3	-1.6
Q	IPL SYS INC	7	1	6.125	-0.1	-2.0
N	MAI BASIC FOUR INC	21	7	8.5	-0.6	-8.0
N	MATSUSHITA ELEC INDL LTD	230	169	189.75	4.6	2.5
Q	MEGADATA CORP	4	1	1.438	-0.1	-8.0
Q	MENTOR GRAPHICS CORP	37	23	32	-2.5	-7.2
N	NBI INC	7	1	1.625	0.0	0.0
N	NCR CORP	70	51	56.5	-1.0	-1.7
N	PRIME COMPUTER INC	21	12	18	-0.6	-3.4
Q	PYRAMID TECHNOLOGY	20	10	18.5	0.3	1.4
Q	SILICON GRAPHICS CORP	25	14	15.25	-1.3	-7.6
Q	STRATUS COMPUTER	32	21	28	-1.0	-3.4
Q	SUN MICROSYSTEM INC	21	13	16.5	0.0	0.0
Q	SYMBOLICS INC	3	1	2	0.0	0.0
Q	SEQUENT COMPUTER SYS INC	26	14	25.75	1.6	6.7
N	TANDEM COMPUTERS INC	21	12	19.625	0.6	3.3
N	TANDY CORP	40	38	43.625	0.1	0.3
N	ULTIMATE CORP	16	8	10.25	-0.1	-1.2
N	UNISYS CORP	33	25	27.75	-0.4	-1.3
A	WANG LABS INC	13	8	9.375	0.0	0.0

Software & DP Services

Q	ADVANCED COMP TECH	4	1	3.5	0.4	12.0
Q	AMERICAN MGMT SYS INC	19	12	16.5	0.4	2.3
N	AMERICAN SOFTWARE INC	21	12	20.125	0.0	0.0
N	ANACOMP INC	12	5	6.75	1.1	20.0
Q	ANALYSTS INTL CORP	15	7	15.125	0.1	0.8
Q	ASHTON TATE	31	19	20	0.0	0.0
Q	ASK COMPUTER SYS INC	18	12	16	-0.8	-4.5
Q	AUTODESK INC	34	22	30	0.5	1.7
N	AUTO DATA PROCESSING	46	35	36.5	0.0	0.0
Q	BMC SOFTWARE INC	17	8	16.6	-0.5	-3.1
Q	COLE & BABBAGE INC	16	8	15.25	0.5	3.4
N	BUSINESSLAND INC	15	8	11.75	0.3	2.2
N	COMPUTER ASSOC INTL INC	40	24	37.5	1.0	2.7
Q	COMPUTER HORIZONS CORP	12	7	8.125	-0.3	-3.0
N	COMPUTER SCIENCES CORP	55	38	48.75	-2.1	-4.1
Q	CORPORATE SOFTWARE	15	9	10.25	0.3	2.5
N	COMPUTER TASK GROUP INC	17	10	14.25	0.6	4.6
Q	COGNOS INC	9	5	7	-0.8	-9.7
Q	COMSHARE INC	29	15	27.75	0.4	1.4
Q	CULLINET SOFTWARE INC	9	4	5.375	0.1	2.4
Q	DUQUESNE SYS INC	24	16	22.5	-1.3	-5.3
N	GENERAL MTRS (CLS E)	47	37	43.25	-0.4	-0.9
Q	HOGAN SYS INC	6	3	4.875	-0.3	-4.9
Q	INFORMIX CORP	25	7	10.375	-0.6	-5.7
Q	INTELLICORP INC	4	2	3.75	0.0	0.0
Q	KEANE INC	27	9	26.5	1.0	3.9
Q	LOTUS DEV CORP	32	15	22.25	1.3	6.0
Q	MANAGEMENT SCI AMER	14	6	8.5	0.6	7.9
Q	MICRO FRO INTL CORP	4	2	1.938	0.0	0.0
Q	MICROSOFT CORP	71	45	50.25	-2.3	-4.3
Q	MORINO ASSOCIATES INC	20	12	20	0.5	2.6
Q	NATIONAL DATA CORP	32	19	26.25	0.9	3.4
N	ON LINE SOFTWARE INTL INC	14	4	5.5	0.0	0.0
Q	ORACLE SYS CORP	26	15	24.25	-0.8	-3.0
N	PANSOPHIC SYS INC	18	12	15.375	0.4	2.5
Q	PHOENIX TECHNOLOGIES INC	19	12	17.25	-0.5	-2.8
Q	POLICY MGMT SYS CORP	27	21	23.25	-0.5	-2.1
Q	PROGRAMMING & SYS INC	18	10	17.25	-0.3	-1.4
Q	RABBIT SOFTWARE INC	3	2	2.25	-0.1	-5.3
Q	RELATIONAL TECHNOLOGY INC	21	12	14.625	-1.1	-7.1
N	REYNOLDS & REYNOLDS CO	29	17	28	0.0	0.0
Q	SEI CORP	22	16	16	-0.4	-2.3
Q	SHARED MED SYS CORP	28	14	18.25	0.1	0.7
Q	SAGE SOFTWARE INC	10	5	8.5	-0.9	-9.3
Q	SOFTWARE PUBG CORP	27	13	16.125	-0.1	-0.8
A	STERLING SOFTWARE INC	9	5	6.375	-0.4	-5.6
Q	SUNGARD DATA SYS INC	20	14	15.25	-0.3	-1.6
Q	SYSTEMATICS INC	34	26	33.5	0.0	0.0
N	SYSTEM CENTER INC	21	12	20.375	-0.4	-1.8
N	SYS. SOFT INC	28	9	20.5	-2.6	-11.4

Semiconductors

N	ADV MICRO DEVICES INC	17	7	8.375	0.1	1.5
N	ANALOG DEVICES INC	16	10	10.625	-0.8	-6.8
Q	ANALOGIC CORP	10	6	9.375	0.8	8.7
Q	CHIPS & TECHNOLOGIES INC	21	11	17	0.8	4.6
Q	INTEL CORP	37	19	25	-1.5	-5.7
Q	LSI LOGIC CORP	14	8	10.625	0.3	2.4
Q	MICRON TECHNOLOGY INC	26	15	18.125	-0.9	-4.6
N	MOTOROLA INC	55	36	41.25	-1.1	-2.7
N	NATL SEMICONDUCTOR	15	8	8.125	0.0	0.0
N	TEXAS INSTRS INC	56	35	36.375	-0.9	-2.2
A	WESTERN DIGITAL CORP	18	11	11	-0.8	-6.4

Peripherals

Q	ALLOY COMP	5	2	2.375	0.3	11.8
N	AM INTL INC	6	3	5.75	-0.1	-2.1
N	AST RESH INC	17	7	7.125	-0.1	-1.7
Q	AUTO TROL TECH CORP	6	4	5	-0.1	-2.4
Q	BANCTEC INC	12	7	11.625	0.1	1.1
Q	CIPHER DATA PRODS INC	11	8	9	-0.5	-5.3
A	CGNITRONICS CORP	5	2	4.5	0.6	16.1
Q	CONNOR PERIPHERALS	10	7	7.25	-0.3	-3.3
A	DATAPRODUCTS CORP	18	9	16.5	-0.1	-0.8
A	DATARAM CORP	9	6	8.375	-0.4	-4.3
N	EASTMAN KODAK CO	50	39	47.125	0.8	1.6
Q	E M C CORP MASS	17	4	4.25	0.1	3.0
Q	EMULEX CORP	12	6	10.125	0.0	0.0
Q	EVANS & SUTHERLAND	21	13	17.5	-0.3	-1.4
Q	ICOT CORP	5	2	2.5	0.0	0.0
Q	INTERLEAF INC	21	6	8.875	-0.3	-2.7
Q	IOMEGA CORP	5	2	2	-0.2	-8.6
Q	LEE DATA CORP	4	2	2.5	0.0	0.0
Q	MASSTOR SYS CORP	4	2	2.375	-0.6	-19.2
Q	MAXTOR CORP	16	6	8.375	-0.8	-8.2
Q	MICROPOLIS CORP	28	6	6.375	0.0	0.0
Q	MINISCRIBE CORP	14	3	2.875	-0.8	-22.7
N	MINNESOTA MNG & MFG CO	70	57	68.5	1.9	2.8
Q	PERSONAL COMPUTER PRODUCTS INC	7	4	4.125	0.1	1.5
Q	PRIAM CORP	2	1	1	0.1	6.6
Q	PRINTRONIX INC	11	7	7.25	-0.3	-3.3
N	QMS INC	12	6	8.875	0.0	0.0
Q	QUANTUM CORP	17	10	15.5	-0.8	-4.6
N	RECOGNITION EQUIP INC	12	6	10.25	0.3	2.5
Q	REXON INC	9	4	7.625	0.3	3.4
Q	SEAGATE TECHNOLOGY	23	7	9.75	-1.0	-9.3
N	STORAGE TECH CORP	4	1	2.125	0.1	6.3
Q	TANDON CORP	3	1	1.188	0.1	8.6
N	TEKTRONIX INC	30	19	22.375	-0.3	-1.1
Q	TELEVIDEO SYS INC	1	0	0.375	0.0	9.0
N	XEROX CORP	67	50	61.25	-1.8	-2.8

Leasing Companies

Q	AMPLICON INC	20	13	19	0.0	0.0
N	CAPITAL ASSOCIATES INTER-NATIONAL INC	9	4	8.625	1.9	27.8
N	COMDISCO INC	26	19	22.875	-1.3	-5.2
Q	CONTINENTAL INFO SYS	9	0	0.625	0.0	0.0
Q	LDI CORPORATION	16	10	15.25	0.8	5.2
Q	PHOENIX AMERN INC	5	3	3.25	-0.3	-7.1
Q	SELECTERM INC	7	4	7	0.0	0.0

EXCH: N — NEW YORK; A — AMERICAN; Q — NATIONAL

A costly tie

Chip contract battle is big news as Street awaits Round 2

Each company sought to put on its best face, but investors seemed to find no clear winner in the first round of the legal battle between Intel Corp. and Advanced Micro Devices.

An arbitration decision handed down March 10 found that Intel had violated contract provisions with AMD. But while AMD is entitled to monetary damages, the ruling found, it has not earned the right to manufacture Intel's 80386 chip. Both companies claimed the battle is not yet over, and it appeared that investors put both stocks on hold as Intel slipped one point during the week to close at 25¾ on Thursday, and AMD edged down ¼ of a point to close at 8⅝.

Microcomputer company stocks stayed even or slightly down over the week as the previous week's revenue revision from Microsoft Corp., down ½ point over the week, kept things on edge. The exception was Lotus Development Corp., which climbed up 1¼ points, perhaps in anticipation of announcements scheduled this week regarding its 1-2-3 (see story page 4).

Digital Equipment Corp. edged up a total of 3 points to close at 113⅞ Thursday, but all bets were off Friday as the market reacted to a report of higher inflation.

FCC ruling

FROM PAGE 1

dential and small-business customers, one for 800 service and one for all other services used by big businesses. Each basket has an average price ceiling that will be adjusted downward by 3% per year.

However, within the business basket, AT&T can increase or decrease the price of individual services by up to 5%. An increase in one service must be offset by a decrease in another service in order for AT&T to remain in compliance with the basket's average rate cap, the FCC explained.

Business users are worried that AT&T will juggle its rates within the business basket in order to raise prices on private lines, steering users to AT&T's switched services, Moir said. "They threw all business services, except 800 service, into one basket," he complained.

AT&T could raise the price of private lines 5% a year — a compound rate of 24% over four years — and reduce the price of switched services 5% per year, Moir said, creating a price differential of 48% after four years.

Richard A. Fazzone, telecommunications affairs manager for GE Information Services, a General Electric Co. unit based in Rockville, Md., expressed the same concern. "When you have broad baskets, you certainly know there is going to be some ability to overprice some services and underprice the others," he said.

Fazzone said that although it remains to be seen how much strategic pricing AT&T employs, users would have gotten more protection if the FCC had placed price ceilings on 15 or 20 baskets of services rather than just three.

Business groups had urged the FCC to create more baskets to prevent such pricing strategies. The Ad Hoc Telecommunications Users Committee, for example, wanted three business baskets for AT&T: one for switched services, one for analog private lines and one for other private line services.

The new regulatory scheme, a pet project of FCC Chairman Dennis R. Patrick during the last two years, encourages AT&T to trim costs and become more efficient in order to boost profits above the current 12.2% profit ceiling. Meanwhile, ratepayers are protected by the price controls, Patrick said.

AT&T issued a statement supporting the price caps order but noted that it considers the scheme an interim step toward eventual deregulation.

Patrick made several changes in his original proposal in order to mollify skeptics in Congress. For example, creating the special basket for residential services was intended to calm fears that residential users would pay for business discounts.

In addition, Patrick said he reluctantly agreed to the 5% floor on price decreases for individual services. He said he generally opposes price floors, but members of Congress are concerned that AT&T could engage in predatory pricing that would unfairly harm its competitors.

Patrick and Commissioner James H. Quello voted for the price caps order. Commissioner Patricia Diaz Dennis concurred but expressed reservations about the complexity of the new regime. "Price caps for AT&T is a second-best solution that results in more, not less, regulation," she said.

Why price caps?

Revamped FCC regulation of AT&T's long-distance rates removes the current 12.2% profit ceiling and replaces it with a set of price controls; the FCC justified its decision with this comparison

Old	New
• Similar to cost-plus contracting, since AT&T can recoup all costs from ratepayers plus a 12.2% profit. This encourages rate-padding and inefficiency.	• AT&T must boost productivity by 20% just to maintain its current earnings levels. Efficiency and cost-cutting can result in higher profits.
• Creates an incentive for AT&T to subsidize competitive business services by shifting costs to residential ratepayers.	• Separate business and residential price baskets will prevent cross-subsidies.
	• Formula will save ratepayers $900 million over four years.

SOURCE: FEDERAL COMMUNICATIONS COMMISSION
CW CHART: JOHN YORK

Behind the scenes

In order to implement the price caps rules, the FCC ordered AT&T to file new tariffs May 17. Gerald Brock, chief of the FCC's Common Carrier Bureau, said AT&T will take its December 1988 rates and apply the 3% downward adjustment to the baskets of services.

The FCC arrived at the 3% figure by combining AT&T's historical productivity factor of 2.5% with a 0.5% "consumer dividend." Consequently, Brock said, the AT&T rates that take effect July 1 are expected to be at least 0.5% lower in real terms (inflation-adjusted) than they would be under the current regulatory regime. However, business groups have argued that the 3% figure is too low and that current rates — the baseline for price caps — are too high [CW, March 6].

The FCC also decided that it will apply the price caps scheme to the local exchange carriers July 1, 1990. Patrick said he is anxious to extend price caps to the local carriers, but it will take another year to calculate a productivity factor for the 1,400 telephone companies. Also, key members of Congress and consumer groups are skeptical that profit ceilings should be removed for telephone companies with local monopolies.

FCC officials said the price caps system, detailed in a forthcoming 500-page order, has the following additional features:

- Prices can go below the 5% floor, but AT&T will be required to demonstrate that it has covered its costs and is not engaged in predatory pricing.
- The price caps scheme does not apply to AT&T Tariffs 12, 15 and 16, which provide special network services and discounts for business and government users. The customer-specific tariffs will be judged on a case-by-case basis.
- Carriers that stay within the price caps limitations will get a 14-day, streamlined review of their tariffs. Tariffs that fall out of the boundaries will be suspended and thoroughly investigated.
- The FCC will monitor carriers to ensure that cost-cutting efforts do not reduce the quality of service.
- After three years of experience with price caps, the FCC will conduct a comprehensive review of the experiment and consider revising the 3% productivity factor.

MITCH BETTS

Procedure blamed in Hinsdale fire

BY ELLIS BOOKER
CW STAFF

The Illinois Commerce Commission (ICC) released its report recently on last year's fire at a Hinsdale, Ill., central office, concluding that Illinois Bell's smoke and fire detection systems were adequate but that a procedural lapse resulted in a 40-minute delay in alerting local firefighters.

The blaze on May 8, 1988, disrupted telephone service to more than 500,000 business and residential customers in Chicago's southwestern suburbs.

The report, prepared by the ICC and the Office of the State Fire Marshal, traced the origins of the fire and made general recommendations for preventing similar disasters. But it did not assess Illinois Bell's responsibility for the event or its liability for losses suffered by customers.

Illinois Attorney General Neil Hartigan, however, said he believes the phone company is liable and should provide compensation. Two days after the Hinsdale fire, he formally petitioned the ICC, requesting the creation of a compensatory fund and public hearings.

Last year, the Illinois Circuit Court dismissed a class-action suit brought against Illinois Bell over the Hinsdale fire, citing the limited liability that Illinois Bell, a utility, enjoys under state law.

Hartigan restated his demands following the report's release, which, he said, "confirms that the company's emergency procedures were inadequate." The ICC will schedule hearings on the matter this week.

The Hinsdale center acted as a hub office, supplying phone service to 42,000 local lines as well as operating 118,000 local and long-distance trunks.

The Hinsdale facility typically was unmanned on weekends and monitored from Illinois Bell's Division Alarm Reporting Center (DARC), 200 miles away. The ICC report noted, "It has become standard industry practice for central offices not to be staffed during nonregular work hours and for alarms to be monitored remotely."

Even so, one of the ICC's recommendations is that fire alarms received by DARC be immediately sent to local fire departments and that, despite the prospect of false alarms, central office alarms ring in local fire departments.

The Hinsdale fire began in the late afternoon in an electrical power line, probably one that had been damaged two months earlier by technicians working on adjacent power lines, the ICC report concluded.

Once the fire began, human error exacerbated the problem when an Illinois Bell network operator, who was monitoring 41 other central offices, departed from established procedures and failed to call the local fire department in Hinsdale immediately after noticing fire and power alarms coming from the remote office.

IBM jacks up product, service prices by 5%

BY ROSEMARY HAMILTON
CW STAFF

IBM said late Friday it is hiking prices on most IBM products and services by 5%. At the same time, the company said it expects first-quarter earnings to fall below projections.

This is the second across-the board increase announced by IBM in less than a year. In July 1988, the company instituted a 5% increase on most products after a "normal business review," the same reason cited for last week's move.

IBM attributed lower profit expectations in the current quarter to technical problems that resulted in delayed shipments of mainframes, a problem it said has now been corrected.

Excluded from the price hikes were certain low-end systems such as the Personal System/2 line and the RT, a few storage devices such as the 3380 and all maintenance contracts.

All products and services announced after Nov. 10 are excluded. Most notable on that list are the new low-end 3090, the ESA-capable 4381 models and high-end Application System/400 models. Any products or services affected by price changes since Nov. 10 are also excluded.

Customers who currently have products on order need not worry about the increase as long as they receive their order within 90 days of last week's announcement, according to an IBM spokesman. Anything shipped after that time will cost 5% more.

The increase will go into effect immediately for new orders under the one-time charge plan. Increases on rentals, leasing or other licensing agreements will not take effect until July 1.

Bringing home the PC pays off

BY ALAN J. RYAN
CW STAFF

It's Sunday night. Corporate accountant Joe Jones has work to finish before Monday, but he won't drive to his office to do it. Instead, he turns on the personal computer his company helped him buy. Using his modem, Joe can access all of his work files.

Firms that augment their employees' home PC purchases, either through discounts, interest-free loans or partial funding, have found that the advantages include a more computer-literate work force, increased productivity and employees who do not feel chained to their desks.

Four years ago, such a program was implemented at Rockwell International Corp. in Pittsburgh. To launch the program, the Rockwell MIS group defined a standard IBM Personal Computer configuration that would be suitable for both work and home use, said Jerry Smith, Rockwell's director of division systems, Measurement & Flow Control Division.

Next, the group compared the price of that configuration with the price for a basic home PC. The group then offered employees the upgraded configuration for the price of a base unit.

In later years, Rockwell dropped that PC purchase program but continued a program in which employees could buy the PCs at low rates. They were able to finance the purchases for two years at no interest.

A similar program has been offered at SPX Corp. in Muskegon, Mich., said Richard Cochrane, the firm's director of information services. There, users were given the option to buy an IBM PC-compatible computer at substantial discounts — interest-free if they purchased a configuration selected by the company. The company conducted free software and hardware training classes for employees and extended the program to family members for a nominal charge, he added.

Firms that standardize on a PC configuration can get better rates from the dealer and offer standard training programs rather than costlier specialized programs, those interviewed said.

"You can go around our offices and see a lot of PCs on desks, and they are being used; they are not gathering dust," Smith noted, adding that having the same configuration both at home and the office reduces the learning curve and saves money.

As valuable as savings in training time, Smith added, has been the informal interchange of information and ideas among those at Rockwell who are all using the same software packages.

The project at Rockwell, offered to all salaried employees, was a runaway success, Smith said. Within the division in Pittsburgh there are approximately 1,200 salaried employees, and more than half of those people took advantage of the PC purchase program, he said.

Cochrane said that more than 30% of SPX's employees in the Muskegon area took advantage of the purchase program.

Other tips offered for companies considering a PC purchase program include the following:

- If the company is willing to help the employee purchase the PC, it should not abandon him after the sale. Training and computer maintenance options should not be overlooked.
- Software should be made available, including easy programs such as games, so that the buyers can feel comfortable with the PC right away.

Programs for employees are not limited to user companies, either. At Apple Computer, Inc., for instance, there is a loan-to-own program. Employees can borrow an Apple system for one year, and ownership of the unit is transferred at the end of the year.

Company asset: Joe Smith's family room

Companies that assist employee PC purchases cite benefits on both the home and work fronts

How company benefits:
• Employees able to do company work at home
• PC training time reduced significantly
• Higher percentage of PC-literate users
• Fewer instances of PCs at work collecting dust
How employee benefits:
• Entire family has access to PC
• Able to spend more time at home
• Receives PC at reduced cost or interest-free
• Payment for PC is spread out over time

CW CHART: FRANK C. O'CONNELL

HP boosts Vectra's speed with dual-bus 386 models

BY J. A. SAVAGE
CW STAFF

PALO ALTO, Calif. — Kicking its desktop personal computer clock speed up to 20 MHz, Hewlett-Packard Co. introduced four models last week of its Vectra QS/20 based on Intel Corp.'s 80386 processor.

Except for the low-end Intel 8086-based models, the Vectras all feature dual-bus architecture, including the IBM Personal Computer AT standard bus. HP is in the Enhanced Industry Standard Architecture (EISA) consortium, which is battling IBM's Micro Channel Architecture, and expects EISA's early implementation on top-performance PCs, which are not in the QS/20 category.

Marjorie Cannon, HP's Vectra product manager, said she expects the current dual-bus configuration to coexist with EISA for several years while EISA appears on systems using an Intel 80486 processor.

This is the second 80386 desktop for HP in the last six months. The earlier model, the QS/16, runs at 16 MHz. Other 20-MHz computers are in a tower configuration with a cache system and one extra I/O slot.

"They've got to get the clock speed up in the whole line," said Jeanette Sill-Holeman, an analyst at research firm Infocorp. "They filled in a hole in their product line."

The QS/20 can be configured with 16-M bytes of random-access memory. It has three mass-storage shelves and seven I/O slots. The models range in price from $4,495 for the basic Model 10 with no hard disk to $5,995 for the Model 100 with a 108M-byte disk.

PC server

FROM PAGE 1

agement issues — a PC just is not adequate. If I had nothing here, I would absolutely go with a mini-based file server."

Owens-Corning Fiberglas Corp. in Amarillo, Texas, is bypassing PC LANs completely because of their cost. Price/performance when compared with a minicomputer has been the PC LAN server's strongest selling point. "It would cost a lot to have different people managing each individual network," said Paul Summer, Owens-Corning's MIS supervisor. When Owens-Corning implements its file server, it will be based on a minicomputer, Summer said.

This runs counter to the conventional wisdom of a year ago, when industry pundits predicted the rapid decline of midrange system demand as LANs moved into departmental computing functions [CW, March 21, 1988].

This is not the news PC vendors wanted to hear heading into Comdex/Spring '89, said John Dunkle, vice-president of Work Group Technology in Hampton, N.H. Dunkle, who has been briefed by the major PC vendors on their plans for Comdex, said that most had planned to emphasize the performance advantages of their 33-MHz 386 PCs as LAN servers. "The fact of the matter is that the processor speed has very little to do with a LAN server," he said.

Dunkle added that companies such as Wyse Technology, Advanced Logic Research and Acer Technologies Corp. are now joining IBM in billing their top-end PCs as LAN servers. According to Gary Stimac, vice-president of systems engineering at Compaq, 25% of its PCs sold are used as LAN servers.

"We are absolutely a LAN server company," Stimac said. He added that in most applications, especially processor-intensive ones such as computer-aided design, users may see up to 35% improvement in performance.

But for most applications, users will see no surge in LAN performance, according to Peter Krause, an engineer at LAN Services, Inc., a consulting group based in New York. With the 640K-byte limitations of MS-DOS, users must rely heavily on storage disk controllers to save and access data. He also listed bus performance, multiple networking topology performance and software drivers as factors equal to the processor in assessing server performance.

"It is extremely difficult for a manufacturer to put out a box optimized as a server as they've invested so much into their existing product lines," Krause said.

Rick Hopfer, vice-president of Shearson Lehman American Express Co.'s micro division, will continue to use PCs as LAN servers. "PCs are adequate as LAN servers; it just depends on what you do with them," Hopfer said. But he added that until Netware 386 is delivered, there will be no noticeable improvement on the LAN.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January of 1989 by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
Copyright 1988 by CW Publishing/Inc. All rights reserved.
Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. *Computerworld* is indexed: back issues, if available, may be purchased at $2.00 per issue, plus postage. Call (800) 669-1002.
Photocopy rights: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Publishing/Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970.
Reprints (minimum 100 copies) and permission to reprint may be purchased from Sharon Bryant, CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Subscriptions call toll free (800) 669-1002.
Requests for missing issues will be honored only if received within 60 days of issue date.
Subscription rates: $2.00 a copy: U.S. — $48 a year; Canada — $110 a year; Central & So. America — $130 (surface), $250.00 (airmail) a year; Europe — $195 a year; all other countries — $295 a year. Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin.

MPA ABC ABP

POSTMASTER: Send Form 3579 (Change of Address) to *Computerworld*, P.O. Box 2044, Marion, OH 43305.

Acquisition to prompt axing

Systems Associates, Inc., a unit of American Express Co.'s Data Based Services Group, announced the signing of an agreement to acquire McDonnell Douglas Health Systems Co., a subsidiary of McDonnell Douglas Information Systems Co.

The acquisition will result in 1,000 layoffs, a spokesman said, reducing the size of the McDonnell Douglas Information Systems' work force to approximately 9,000.

Jeremy J. Causley, president of McDonnell Douglas Information Systems, said the sale "was one of many moves made in the past seven months to focus the direction and strengthen the competitive position of McDonnell Douglas Information Systems."

The Health Systems sale completes McDonnell Douglas Information Systems' divestiture of its health-related companies.

TRENDS

Page printers

It used to be that if you wanted a faster, more versatile or higher quality anything, you had to roll up your sleeves and dig deep into the company coffers. Nowhere is there a better example of the erosion of that belief than in the page printer market.

Once the pricey distant cousin of the line printer, nonimpact page printers are coupling increasing quality with plummeting prices and making rapid inroads in the system printer market, according to survey results issued recently by research firm Computer Intelligence (CI).

Since 1985, nonimpact page printers have doubled their penetration in the system printer market and now account for 26% of purchases in that area, the La Jolla, Calif.-based firm said.

Why the increase? Page printers offer more for less. They print high-resolution forms and graphics as well as mixing text and graphics, and their price continues to drop. A low-speed, low-volume page printer can now be had for less than $2,000.

Although high-volume devices accounted for 61% of page printers installed at IBM mainframe sites surveyed, as the high-quality, low-volume printers come out, so do consumers' checkbooks. Only 17% of IBM mainframe sites interviewed within the past eight months said they have low-end page printers in their offices, but more than 90% of future printer purchases will be low-end models.

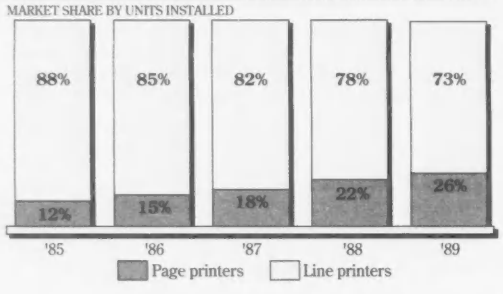
This gravy train also seems likely to continue far into the future. The survey states that once users know their way around a desktop-model page printer, few will consider going back to impact technology.

The big winners in this user movement are likely to be IBM and Xerox Corp., which still dominate the page printer market at IBM mainframe sites. Together, the pair account for 85% of installed page printers. But CI said industry soothsayers should keep an eye peeled for Hewlett-Packard Co., which is shaping up as a dark horse candidate — 75% of those surveyed plan on buying an HP printer.

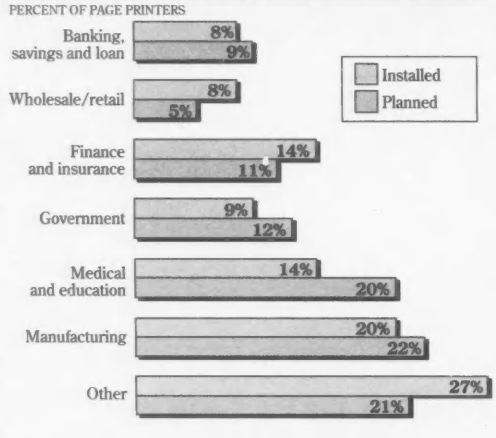
Page printers are particularly popular in the manufacturing industry, which boasts the greatest percentage of both installed and planned printers. Other top areas for both installed and planned page printers include the finance and insurance fields, government offices and medical or educational facilities.

JAMES DALY

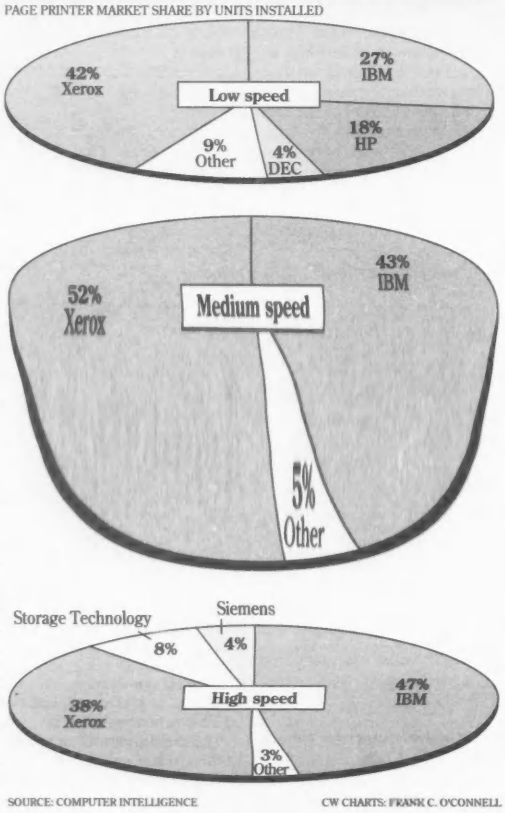
Slow but steady growth in popularity



Manufacturers are biggest buyers



Xerox, IBM dominate at all levels



SOURCE: COMPUTER INTELLIGENCE

CW CHARTS: FRANK C. O'CONNELL

INSIDE LINES

They want to pump it up. The stepped-up technology cycles and recent blitzkrieg of product introductions coming out of the fabled mills of DEC may be indicative of things to come. With the forecast of dismal quarterly financials looming, several observers claim there is a major reorganization under way at DEC, with more emphasis on pumping out products and less on vertical market positioning.

Bandages on the bLeading Edge. Things are beginning to look up for troubled Canton, Mass.-based Leading Edge Hardware Products and parent Leading Edge Products, which owes $11 million to creditors and is operating under the protection of Chapter 11 of the U.S. Bankruptcy Code. Court-appointed trustee Steven S. Gray has worked out an agreement in principle with Leading Edge supplier Daewoo Telecom Co. to continue to supply computers under the Leading Edge name until October. Gray also secured a $550,000 line of credit to fund operations until creditors are paid. Meanwhile, the bankruptcy court has extended temporary restraining orders to enforce the exclusive distributorship between Daewoo and Leading Edge.

Oh yeah? Well, watch this! With Intel's expected launching of its 33-MHz microprocessor this spring, one-upmanship will climb to new heights, industry sources said. Having been briefed by IBM and Compaq, industry sources say that IBM will announce — but not make available — its 33-MHz-based 386 system at Comdex/Spring '89 in Chicago. Sources add that Compaq will then wait two weeks to announce its 33-MHz machine, which is expected to be lower in price and available sooner than the IBM machine.

Coming soon to your pocketbook . . . Sorbus plans to move into the IBM 3090 service market, which belonged solely to IBM until a few months ago. Late last year, Control Data and a few other smaller companies took the 3090 service plunge as well. Service on 3090s had only been offered by IBM because it requires a tremendous effort and involves remote support facilities. A Sorbus spokesman would not commit to a launch date, saying the company is now assessing the market. But, he added, "We fully intend to be in that business."

Will they ring in the bell? The telecom market is anxiously awaiting mid-April, when Merrill Lynch is expected to announce the winner of what could be one of the largest private-sector telecommunications contracts in history. The financial services giant will choose between AT&T and MCI to supplement — or possibly supplant — its internal telecom resources. Merrill Lynch hopes to save $20 million to $30 million per year in internal costs, said DuWayne Peterson, executive vice-president of operations/systems and telecommunications. As with the multibillion-dollar federal FTS-2000 contract, each bidder has lined up systems integrators on its bid: MCI is teamed with EDS and IBM, while AT&T is bidding with Computer Sciences.

Inter(your)face. Looking like a mere shadow of its former robust self, Interface went out like a lamb after a roar of preshow publicity. Attendance was so poor, according to a Northern Telecom spokesman, that two visitors to his booth said they were let into the show *free* "just to get some warm bodies in here." Minimal product introductions kept pace with at least 17 empty booths. Another observer directed attention to the aisles, which eventually widened to two aisles' worth and succeeded only in making the show look even more poorly attended. A spokesman for Fibronics, which has nixed a return engagement, said a number of the show's largest exhibitors — IBM and AT&T, for example — have signed up for next year but reserved "significantly less" booth space.

Come one, come all to the ugly-news ball. Scoops, scandals, scams and screams — if they're legit, we'll serve as the messenger. You've always been able to call in to the hot line at 800-343-6474 or 508-879-0700. Now you can interface with our bulletin board by hitching your modem to 508-626-0165; you can point News Editor Pete Bartolik in the right direction or avail yourself of a variety of other evolving services.

Why can't mainframes speak English?

You have to wonder why the people who design big computers make it so difficult for normal human beings to use them.

Particularly non-technical, hastily trained human beings, who need to talk to the mainframe from their PCs.

It's been a serious dilemma. Until NOW!

NOW! is a menu-making, macro-writing tool that automates the drudge work of PC-to-host communication.

When someone wants to review their E-Mail, for instance, all they need do is make one menu selection.

NOW! then takes on the tedious job of loading the 3270 software, logging onto the mainframe, and wading through the passwords and commands to arrive at the E-Mail screen.

It's not hard to see how NOW! reduces wasted time, needless stress and training costs.

Nor is it difficult to find out more. Simply call or write and we'll send you a free demo disk and detailed information.

All of which, you'll be pleased to hear, is written in a language called English.

NOW!
PC/HOST AUTOWARE™

Attachmate

1-800-426-6283
IN WASHINGTON STATE 206-644-4010.

NOW! and Autoware are trademarks of Attachmate Corp., Bellevue, Wa.
IBM is a registered trademark of International Business Machines Corporation.

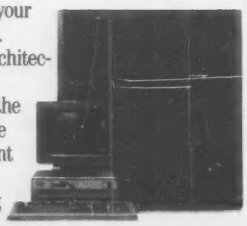
NOT ALL FINANCIAL SOFTWARE IS CREATED EQUAL

INTRODUCING FULL MAINFRAME FINANCIAL SOFTWARE FUNCTIONALITY—ON THE PC.

Now you can run the *same* Data Design mainframe financial software on *both* your mainframe and your PC. Throughout your corporation. Exactly the same. Eqqual.

Data Design's exclusive Eqqual architecture makes it all possible.

From corporate headquarters to the smallest remote office, anyone can take advantage of sophisticated management software. Software used by major corporations—from Alcoa to Pillsbury, Bankers Trust to General Electric.



You save data processing and production costs since you only have one system to support. You can install, tailor, test and train without waiting for valuable mainframe resources.

And your PC users don't have to settle for PC software.

Eqqual financial systems *fit* your business needs, without changing the way you do business. Eqqual systems *adapt* to new corporate strategies and easily assimilate changes due to mergers and acquisitions. Eqqual systems *unify* your corporation.

Eqqual. Financial information the way you need it. On the mainframe. On the PC. Everywhere in your business enterprise. The foundation for distributed data processing. And your competitive edge in financial management software.

Let Data Design show you mainframe financial software that runs on a PC! In your office. Today. Call us at **800/556-5511, ext. 800.**

DATA DESIGN ASSOCIATES

1279 Oakmead Parkway, Sunnyvale, CA 94086

Providers of General Ledger, Accounts Payable, Purchasing, Fixed Assets, and Project Accounting Software.

Available on IBM 43XX, 30XX, 9370, PS/2,™ PC/AT,™ and compatibles, and DEC VAX.® Eqqual is a trademark of Data Design Associates, Inc. All others trademarked by others.